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# *NPL PRIORITIZATION CRITERIA MEMO*

**Submitted To:** Jere Johnson, EPA Region IX Work Assignment Manager

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**Date:** February 22, 1993

**Site:** Stauffer Chemical Company (alias ICI Americas Inc.)

**EPA ID#:** CAD009123456

## Introduction

URS Consultants, Inc. (URS) evaluated each of the following criteria in order to assist the U.S. Environmental Protection Agency (EPA) in determining if the Stauffer Chemical Company (Stauffer) site is appropriate for National Priorities List (NPL) consideration.

In 1897, Stauffer purchased the 75-acre site and had begun chemical production operations by 1906. Stauffer produced a variety of industrial and agricultural chemicals until 1985. In March 1985, Chesebrough-Ponds merged with Stauffer. In December 1986 several Chesebrough-Ponds divisions, including Stauffer, were purchased by the Unilever Corporation. In 1990, ICI Americas purchased the site, and it is the current site owner and operator.

Stauffer manufactured, formulated, and bulk loaded agricultural chemicals. Chemicals manufactured by Stauffer include sulfuric acid, aluminum sulfate, titanium trichlorate, Vapam, and Devrinol. Chemicals formulated by Stauffer include Betasan, Captam, Devrinol, Eptam, Ordram, Ro-Neet, Tillan, and Trithion. Chemicals bulk loaded by Stauffer include caustic soda, hydrochloric acid, hydrofluosillic acid, tetrachloroethylene (PCE), carbon disulfide, Sutan, Silbond, and Silbond-40. Trithion is the only formulated organophosphate pesticide manufactured at the facility; all other formulated chemicals are thiocarbamates pesticides. Although no information is available regarding Stauffer's formulation, manufacturing, or bulk loading of DDT, an extremely hazardous waste manifest from 1983 shows Stauffer disposed of DDT. The origins of polychlorinated biphenyls (Aroclor-1248) found in soil and sediment samples collected during the URS sampling event is unknown.

## Present and Future State Involvement

The California Regional Water Quality Control Board (RWQCB) is presently overseeing the remediation of pesticides from groundwater at the site. RWQCB has, in the past, overseen several investigations at the site. These investigations have included underground storage tank investigations, National Pollutants Discharge Elimination System (NPDES) permit violation investigations, investigations of surface impoundments for the Toxic Pits Cleanup Act (TPCA), and a solid waste assessment test of the cinder landfill. NPDES permitting oversight has also been conducted by RWQCB. Imperial Chemical Industries Americas (ICI Americas), the current site operator, holds two source permits for air discharge from the Bay Area Air Quality Management District. The California Environmental Protection Agency Department of Toxic Substances Control (Cal EPA DTSC) is involved in the oversight of hazardous waste management practices at the site. There are no state agencies actively investigating the need for remedial action due to landfill, surface impoundment, and wetland contamination attributable to the Stauffer site.

## Other Regulatory Agency Involvement

The Stauffer site is under the jurisdiction of the Contra Costa County Health Department, Hazardous Materials Division (County Health). County Health has been involved in the installation and removal of underground storage tanks at the facility.

## Site Owner/Operator Involvement

The current site owner, ICI Americas, performed an investigation in 1988 regarding the evaporation ponds under TPCA. In 1991 ICI Americas completed overhauling the wastewater treatment system at the site. Wastewater, which was formerly discharged to San Francisco Bay, is now transferred via pump and pipe to the Richmond Publicly Owned Treatment Works (POTW). ICI Americas submitted a report describing site-wide groundwater conditions at the site to RWQCB in December 1992. Although ICI Americas has been the site owner since 1990, problems associated with hazardous materials are primarily attributable to waste management practices conducted by Stauffer.

## Community Relations/Involvement

In 1980 Citizens for a Better Environment (CBE) issued a letter concerning groundwater contamination at the Stauffer site. CBE stated several specific points regarding the groundwater investigations taking place at the site. CBE proposed that additional work be conducted, including the interception and treatment of the storm sewer, several soil borings, and sediment sampling of evaporation ponds and the tidal marsh. ICI Americas currently intercepts and treats dry weather flows from the storm sewer. Sampling of evaporation ponds was conducted under TPCA in 1987 and 1988. URS conducted sediment sampling of evaporation ponds and the tidal marsh for EPA in October and November 1992.

The West Contra Costa County Toxics Coalition is a community group that has also been involved in hazardous waste issues in the Richmond area.

In 1983, Cal EPA DTSC, formerly California Department of Health Services, received a request from Citizens Action League to inspect any available files pertaining to the site. It

is unknown if this file inspection was ever conducted or if this inspection generated a response.

## Relation to Other Sites

Several sites within 2 miles of the Stauffer site are listed in the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) and associated with hazardous wastes and hazardous materials.

The United Heckathorn NPL site (EPA ID# CAD981436363) is located approximately 2 miles west of the Stauffer site.

The Liquid Gold NPL site (EPA ID# CAT000646208) is located approximately 0.25 miles east of the Stauffer site along Carlson Creek.

Adjacent to the western boundary of the Stauffer site is the Richmond Field Station (EPA ID# CAD980673628) operated by U.C. Berkeley. It was formerly a research laboratory and handled hazardous materials and generated hazardous waste.

The Blair Southern Pacific Landfill (EPA ID# CAD980496889) is located at the foot of South 51st Street, directly east of the site. The only known disposal of materials in the Blair Southern Pacific Landfill was the disposal in 1971 of approximately 6,200 tons of wastes generated by Stauffer. The Preliminary Assessment for the Blair Southern Pacific Landfill stated that the landfill should be addressed under the Site Inspection of the Stauffer site.

## Outstanding HRS Issues

A complete ecological assessment of the evaporation ponds and the tidal marsh areas adjacent to the Stauffer site has not been conducted. An exact count of people living in a new development to the west northwest of the site has not been conducted, and estimated values are now used for HRS purposes. The area of contamination accessible to nearby residents is estimated to be 25,000 square feet. This may underestimate actual accessible areas. A full analytical characterization of the cinder landfill has not been conducted. Because cinder wastes were used as general fill throughout the site, information provided in the Solid Waste Assessment Test (SWAT) regarding the extent of the cinder landfill may underestimate the size of the cinder landfill. The amount of fish caught in San Francisco Bay within 15 miles of the Stauffer site is approximately 1,000,000 pounds per year; hard data on the catch within this area are unavailable. For purposes of the HRS and observations made during the URS sampling, it is estimated that 2,500 pounds of fish is taken from sloughs within the tidal marsh on an annual basis. Fish caught from within the boundaries of the tidal marsh are subject to Level II contamination.

The HRS score may underestimate the potential for nearby residents, recreational users, and sensitive environments to be exposed to wastes associated with the Stauffer site.

## Data Summary

At the request of EPA Region IX, URS has reviewed existing data for the Stauffer site. These data have been evaluated for their representativeness, appropriateness, reproducibility, and magnitude compared to relevant benchmarks. Copies of the data and sample location maps are provided with this summary. Although several sampling

events have occurred at the Stauffer site, only the URS SI sample event and the 1987 TPCA investigation of surface impoundments will be evaluated in this Data Summary, since these data are the only results used to document the site HRS score.

## Summary of Previous Sampling Events

The following table describes the types of samples collected and analyzed during the 1992 URS and the 1987 TPCA investigations of the Stauffer site. Method numbers used during analysis are provided, where available. Analyses conducted include Contract Laboratory Program (CLP) analysis using EPA approved methods and non-CLP analysis. The table also indicates if representative field quality control samples (blanks, duplicates) were collected.

| MEDIA SAMPLED | VOCs | PEST. | METALS | BKGD | BLANKS | DUPS. |
|---|---|---|---|---|---|---|
| Groundwater | --- | --- | --- | --- | --- | --- |
| Surface Water, 1987 | 8020, 624, 625 | 85-25[1] | --- | No | Yes | Yes |
| Surface Water (sludge), 1987 | 8020 624, 625 | 85-26[1] | 3050, WET[2] | No | No | Yes |
| Surface Water (sediments), 1992 | --- | 8080, 8141 | 6010 | Yes | No | Yes |
| Soils, 1992 | --- | 8080, 8141 | 6010 | Yes | No | Yes |
| Air | --- | --- | --- | --- | --- | --- |

1 = Stauffer Chemical Company method for proprietary pesticide analysis.
2 = California Waste Extraction Test for soluble metals.

URS Sampling, 1992

Under the direction of EPA, the URS team prepared a field Sample Plan to collect soil and sediment samples at and around the Stauffer site. This plan was reviewed by EPA's Quality Assurance Management Section and EPA's Site Mitigation Branch. The final Sample Plan was approved by EPA on October 13, 1992.

URS sampling of the Stauffer site was conducted to identify contaminants present in wastes in the cinder landfill, former sedimentation ponds, and evaporation ponds, and to determine if wastes had migrated from on-site sources to the adjacent tidal marsh areas. Samples were collected on October 26, 27, and November 23, 1992.

A total of six soil samples, including one duplicate and one background sample, were collected during the URS sampling. Two soil samples and one duplicate soil sample were

collected from cinder landfill wastes. Two soil samples were collected from areas formerly used as sedimentation ponds. One background soil sample was collected from a undeveloped recreational area approximately 0.50 miles south of the site.

A total of 21 sediment samples, including three duplicates and three reference samples, were collected during the URS sampling event. Fourteen sediment samples, including two duplicates, were collected from tidal marsh areas adjacent to the Stauffer site. Two tidal marsh background sediment samples were collected from Hoffman Marsh approximately 0.5 miles south of the Stauffer site. Four sediment samples, including one duplicate, were collected from the upper and lower freshwater evaporation ponds. A fresh water background sample was collected from sediments in Carlson Creek at East Shore Park, located approximately 0.5 miles northeast of the site and above the zone of tidal influence.

Analysis of soil samples collected from the cinder landfill at the Stauffer site revealed elevated levels of arsenic up to 294 milligrams per kilogram (mg/Kg), cadmium up to 15.5 mg/Kg, copper up to 1,310 mg/Kg, mercury up to 30.2 mg/Kg, zinc up to 2,240 mg/Kg, alpha-hexachlorocyclohexane (a-BHC) up to 150 micrograms per kilogram (µg/Kg), beta-hexachlorocyclohexane (b-BHC) up to 35 µg/Kg, delta-hexachlorocyclohexane (d-BHC) up to 4 µg/Kg, gamma-hexachlorocyclohexane (Lindane) up to 27 µg/Kg, aldrin epoxide (Dieldrin) up to 52 µg/Kg, p,p-dichlorodiphenyl dichloroethlyene (DDE) up to 410 µg/Kg, dichlorodiphennyl dichloroethane (DDD) up to 170 µg/Kg, 4,4-dichlorodiphenyl trichloroethane (DDT) up to 1,800 µg/Kg, Endrin ketone up to 7 µg/Kg, Endrin Aldehyde up to 15 µg/Kg, alpha-octachloro-4,7-methanotetrahydroindane (alpha-Chlordane) up to 22 µg/Kg, gamma-octachloro-4,7-methanotetrahydroindane (gamma-Chlordane) up to 34 µg/Kg, and Arochlor-1248 [a polychlorinated biphenyl (PCB)] up to 640 µg/Kg.

Analysis of sediment samples collected from the tidal marsh and evaporation ponds at the Stauffer site revealed elevated levels of arsenic up to 1,660 mg/Kg, cadmium up to 14.6 mg/Kg, copper up to 1,930 mg/Kg, mercury up to 10.9 mg/Kg, zinc up to 5,490 mg/Kg, A-BHC up to 300 µg/Kg, B-BHC up to 66 µg/Kg, D-BHC up to 70 µg/Kg, Lindane up to 14 µg/Kg, Dieldrin up to 37 µg/Kg, DDE up to 120 µg/Kg, DDD up to 180 µg/Kg, DDT up to 370 µg/Kg, Endrin ketone up to 2 µg/Kg, Endrin Aldehyde up to 18 µg/Kg, alpha-Chlordane up to 24 µg/Kg, gamma-Chlordane up to 14 µg/Kg, and PCBs up to 160 µg/Kg.

TPCA Surface Impoundment Assessment, 1987

In 1987, an assessment was conducted to determine levels of toxic materials in water and sludge from eight surface impoundments at the Stauffer site. The surface impoundments included the carbon column pond, the agricultural yard pond (Ag-Yard pond), the alum mud pond, the neutralization pond, the clarification pond, a surge pond, the upper evaporation pond (evaporation pond 1), and the lower evaporation pond (evaporation pond 2). Samples were analyzed for total metals, soluble metals by the California Waste Extraction Test (WET), volatile aromatic compounds by EPA Method 8020, volatile compounds by EPA Method 624, semi-volatile compounds by EPA Method 625, and proprietary pesticides.

A total of six water samples, including one duplicate sample, were collected from the carbon column pond, Ag-Yard pond, the surge pond, the neutralization pond, and the clarification pond. Samples were analyzed for soluble metals. Results of this analysis determined that concentrations of metals in water samples did not meet or exceed the

California Soluble Threshold Limit Concentration (STLC) or Ambient Water Quality Criteria Levels.

A total of 31 sludge samples, including two duplicate samples, were collected from the neutralization pond, the surge pond, the carbon column pond, the Ag-Yard pond, evaporation pond 1, and evaporation pond 2. Sludge samples were analyzed for total metals. Results of this analysis revealed several samples that contained metal concentrations in excess of the STLC. Analysis revealed that sludge samples collected from the Ag-Yard pond contained levels of copper and zinc in excess of the California Total Threshold Limit Concentration (TTLC). Copper concentrations in Ag-Yard pond sludge were found to be up to 10,631 mg/Kg, exceeding the TTLC of 2,500 mg/Kg. Zinc concentrations in Ag-Yard pond sludge were up to 10,099 mg/Kg, exceeding the TTLC of 5,000 mg/Kg. Zinc concentrations in the carbon column pond were up to 7,275 mg/Kg, exceeding the TTLC. There are no federal benchmark concentrations for contaminants in sludges.

A total of 23 sludge samples, including two duplicate samples, were collected from the neutralization pond, the surge pond, the carbon column pond, the Ag-Yard pond, evaporation pond 1, and evaporation pond 2. Samples were analyzed for soluble metals by use of the WET test. Analysis revealed levels of arsenic, copper, lead, fluoride, selenium, and zinc in excess of the STLC (see Table 1).

A total of eight water samples, including one duplicate sample, were collected from the neutralization pond, clarification pond, carbon column pond, Ag-Yard pond, surge pond, evaporation pond 1, and evaporation pond 2. Samples were analyzed for proprietary pesticides by methods developed by Stauffer. Results of this analysis are described in Table 2.

A total of 21 sludge samples, including one duplicate sample, were collected from the neutralization pond, carbon column pond, Ag-Yard pond, surge pond, evaporation pond 1, and evaporation pond 2. Samples were analyzed for proprietary pesticides by methods developed by Stauffer. The maximum concentration of pesticides in each pond are described in Table 3.

A total of 18 water samples, including two duplicate samples, were collected from the neutralization pond, clarification pond, carbon column pond, and the Ag-Yard pond. Samples were analyzed for volatile aromatics by EPA Method 8020. Analysis revealed detectable levels of xylenes up to 0.09 milligrams per liter (mg/L), and 1,4-dichlorobenzene up to 0.02 mg/L in the carbon column pond.

A total of 16 sludge samples, including one duplicate sample, were collected from the neutralization pond, surge pond, carbon column pond, and Ag-Yard pond. Samples were analyzed for volatile aromatics by EPA Method 8020. Results of this analysis are described in Table 4.

A total of 24 water samples, including two duplicate samples, were collected from the neutralization pond, clarification pond, carbon column pond, Ag-Yard pond, surge pond, evaporation pond 1, and evaporation pond 2. Samples were analyzed for volatile organics by EPA Method 624. Results of this analysis are described in Table 5.

**Table 1**
**Stauffer Chemical Company**
**Soluble Metals in Sludge Samples by Waste Extraction Test**
**Maximum Values**
**TPCA Assessment, 1987**

Concentrations in mg/L

| Description | NP | CCP | AYP | SRG | EV1 | EV2 | STLC |
|---|---|---|---|---|---|---|---|
| Arsenic | 1.6 | NA | NA | NA | 7.8 | 9.0 | 5 |
| Cadmium | NA | ND | 0.9 | NA | NA | NA | 1 |
| Chromium | NA | NA | NA | NA | 0.4 | 3.1 | 560 |
| Copper | 0.6 | ND | 600 | 11.4 | 11 | 0.14 | 25 |
| Lead | 18.2 | 0.04 | 0.2 | 0.9 | 3.4 | 55 | 5 |
| Fluoride | 100 | 40 | 310 | 190 | 150 | 140 | 180 |
| Selenium | 0.5 | 0.6 | 1.1 | 0.7 | 0.4 | 0.5 | 1 |
| Zinc | NA | 106 | 279 | 23 | NA | NA | 250 |

NP = Neutralization Pond
CCP = Carbon Column Pond
AYP = Agricultural Yard Pond
SRG = Surge Pond
EV1 = Evaporation Pond 1
EV2 = Evaporation Pond 2

STLC = California Soluble Threshold Limit Concentration

NA = Not Analyzed

ND = Not Detected

**Table 2**
**Stauffer Chemical Company**
**Proprietary Pesticides in Water Samples**
**TPCA Assessment, 1987**

Concentrations in mg/L

| Description | EPTC | Butylate | Vernolate | Pebulate | Molinate | Cycloate | Napropamide | Vapam ✶ |
|---|---|---|---|---|---|---|---|---|
| NP | ND | ND | ND | ND | ND | ND | 0.002 | ND |
| CP | ND | ND | ND | ND | ND | ND | ND | ND |
| CCP | 0.050 | 0.001 | 0.005 | 0.021 | 0.34 | 0.007 | 0.014 | ND |
| AYP | 0.19 | 0.002 | 0.017 | 0.089 | 0.95 | 0.026 | 0.007 | ND |
| SRG | ND | ND | ND | ND | ND | ND | ND | ND |
| EV1 | ND | ND | ND | ND | ND | ND | ND | ND |
| EV2 | ND | ND | ND | ND | ND | ND | ND | ND |

NP = Neutralization Pond
CP = Clarification Pond
CCP = Carbon Column Pond
AYP = Agricultural Yard Pond
SRG = Surge Pond
EV1 = Evaporation Pond 1
EV2 = Evaporation Pond 2

✶ Analyzed as the hydrolysis product: methylisothiocyanate; reported as Vapam

ND = Not Detected

**Table 3**
**Stauffer Chemical Company**
**Proprietary Pesticides in Sludge Samples, Maximum Values**
**TPCA Assessment, 1987**

Concentrations in mg/Kg

| Description | EPTC | Butylate | Vernolate | Pebulate | Molinate | Cycloate | Napropamide | Vapam ✶ |
|---|---|---|---|---|---|---|---|---|
| NP | ND | ND | ND | ND | ND | ND | 0.17 | ND |
| CCP | 34.6 | 3.65 | 4.62 | 8.61 | 48.4 | 4.90 | 260 | 3.54 |
| AYP | 0.54 | 0.059 | 0.24 | 1.97 | 7.12 | 0.73 | 1.09 | ND |
| SRG | 0.27 | 0.02 | 0.03 | 0.11 | 3.80 | 0.04 | 0.57 | ND |
| EV1 | 0.13 | 0.02 | 0.02 | 0.38 | 0.02 | 0.04 | 0.78 | 0.47 |
| EV2 | 210 | 4.0 | 76 | 280 | 250 | 29 | 58 | ND |

NP = Neutralization Pond
CP = Clarification Pond
CCP = Carbon Column Pond
AYP = Agricultural Yard Pond
SRG = Surge Pond
EV1 = Evaporation Pond 1
EV2 = Evaporation Pond 2

✶ Analyzed as the hydrolysis product: methylisothiocyanate; reported as Vapam

ND = Not Detected

**Table 4**
**Stauffer Chemical Company**
**Volatile Aromatics in Sludge Samples by EPA Method 8020**
**Maximum Values**
**TPCA Assessment, 1987**

Concentrations in mg/Kg

| Description | NP | CCP | AYP | SRG |
|---|---|---|---|---|
| Benzene | ND | 14 | ND | 22 |
| Toluene | 0.5 | 204 | ND | 4.6 |
| Chlorobenzene | ND | 12.3 | 0.3 | 0.7 |
| Ethylbenzene | ND | 1.0 | ND | 0.3 |
| Xylenes (P&M) | ND | 4.2 | ND | 0.4 |
| Xylene (O) | ND | 0.5 | ND | 0.1 |
| 1,2-Dichlorobenzene | 0.7 | 2.0 | ND | 0.1 |
| 1,3-Dichlorobenzene | 0.4 | 3.2 | ND | 0.4 |
| 1,4-Dichlorobenzene | 0.6 | 1.9 | ND | 0.1 |

NP = Neutralization Pond
CCP = Carbon Column Pond
AYP = Agricultural Yard Pond
SRG = Surge Pond

ND = Not Detected

# Table 5
## Stauffer Chemical Company
## Volatile Organics in Water Samples, Maximum Values
## TPCA Assessment, 1987

Concentrations in µg/L

| Description | NP | CP | CCP | AYP | SRG | EV1 | EV2 |
|---|---|---|---|---|---|---|---|
| 1,1-DCA | 40 | 30 | 57 | 40 | 3 | 29 | ND |
| 1,1-DCE | ND | ND | 1 | ND | ND | ND | ND |
| Benzene | ND | ND | 51 | ND | ND | ND | ND |
| Chlorobenzene | ND | ND | 46 | 260 | ND | ND | ND |
| Carbon Tetrachloride | ND | ND | 3 | ND | ND | ND | ND |
| Chloroform | ND | ND | 47 | ND | ND | ND | ND |
| Ethyl Benzene | ND | ND | 1 | ND | ND | ND | ND |
| Methylene Chloride | ND | ND | 2,200 | ND | ND | ND | ND |
| PCE | ND | ND | 7 | 30 | ND | 2 | ND |
| TCE | ND | ND | 11 | 40 | ND | ND | ND |
| Toluene | ND | ND | 1,000 | 20 | ND | ND | ND |
| Naphthalene | ND | ND | ND | ND | ND | ND | ND |
| 1,2-Dichlorobenzene | ND | ND | ND | 6 | ND | ND | ND |

NP = Neutralization Pond
CP = Clarification Pond
CCP = Carbon Column Pond
AYP = Agricultural Yard Pond
SRG = Surge Pond
EV1 = Evaporation Pond 1
EV2 = Evaporation Pond 2

ND = Not Detected

## Discussion of Data

Sample Representativeness:

The soil and sediment samples of waste sources collected during the URS sampling event may not be fully representative of hazardous wastes disposed of at the site. Only three samples, including one duplicate sample, of the cinder landfill wastes and four samples, including one duplicate, of evaporation pond sediments were collected to identify contaminants present in source areas at the site. Due to the limited number of soil samples, further characterization of the cinder landfill may be necessary at a later date. Sediment sampling of tidal marsh areas near the Stauffer site during the URS sampling event is representative of conditions existing in the tidal marsh areas. A total of 16 sediment samples, including two duplicate and two reference samples, were collected from these areas. The extent of the URS sampling has provided a reasonable characterization of the tidal marsh areas adjacent to the site.

Analytical data from the 1987 TPCA investigation characterized in more detail the contaminants present in surface impoundments and ponds at the Stauffer site. Duplicate samples collected for the TPCA investigation are highly consistent and suggest that contaminant concentrations detected are representative of site conditions in 1987. Since that time, many of the ponds have been closed under the supervision of the California RWQCB and have been converted into surge ponds.

Appropriate Analyses:

EPA-approved CLP analytical methods were used to analyze soil and sediment samples collected for the URS sampling event. The breadth of analysis is appropriate for the types of fill materials presumed to be located at the site with the exception of analysis for thiocarbamate pesticides and volatile organics. Thiocarbamate pesticides manufactured or formulated by Stauffer include Vapam, Ordram, Devrinol, Eptam, Ro-Neet, Tillan, and Trithion. These substances are currently not listed as analytes in any EPA-approved CLP analytical methods or in the chemical data matrix used to evaluate characteristics of the hazardous substances for HRS evaluation. Volatile organic compounds had been found in sedimentation pond wastes before the closure of the sedimentation ponds. Due to the nature of these compounds, it is unlikely for volatiles to remain in sediments for extensive periods of time; however, analysis of former sedimentation pond solids have detected volatile organics. The URS sampling included the collection and analysis of background soil and sediment samples from both freshwater and saltwater bodies. Lab quality control samples were also collected for soil and sediment samples. Detection limits for soil and sediment samples are considered appropriate for comparing contamination to applicable benchmarks.

Most analyses used in the 1987 TPCA investigation of surface impoundments were EPA-approved analyses. Analysis for soluble metals is conducted using the WET test developed and approved by the State of California. The analytical method for the determination of proprietary pesticide concentrations was developed by Stauffer and has not been approved by any regulatory agency.

Reproducibility of Results:

Soil and sediment samples were collected as part of the URS sampling of the Stauffer site. quality assurance/quality control (QA/QC) and duplicates samples were collected. The

consistency of results between duplicate pairs suggests that these results are reproducible. Sample locations are described in detail in field log books furthering the reproducibility of sampling results. Metals contamination of evaporation ponds has been revealed in previous sampling events conducted by consultants for the site operator, adding to the validity and reproducibility of the URS sampling results.

The results of the 1987 TPCA investigation are not completely reproducible because many of the surface impoundments evaluated no longer exist. Surface impoundments investigated in 1987 that still exist include the surge pond, evaporation pond 1, and evaporation pond 2. Sample locations in the 1987 TPCA investigation report are poorly described, further hindering the reproducibility of sampling results. The URS sampling of evaporation pond sediments revealed similar results when compared to the 1987 TPCA analyses.

Relevant Benchmarks:

The cinder landfill and former sedimentation ponds at the Stauffer site were sampled on October 26 and 27, 1992 as part of a URS sampling effort. Soil samples were collected at depths of between 1.0 and 3.0 feet below ground surface (bgs). Landfill materials and evaporation pond sediments were found to contain elevated levels of several contaminants. Maximum concentrations of contaminants found in soil samples and relevant benchmarks are presented in Table 6.

Sampling for the TPCA investigation of surface impoundments at the Stauffer site was conducted on August 10, August 18, September 16, October 2, October 6, and October 15, 1987. Maximum concentrations of contaminants found in water and sludge samples and relevant benchmarks are presented in Tables 1,2,3, and 4.

**Table 6**
**Hazardous Substance Benchmark Tables**
**For Contaminants Found in Soils at Greater Than**
**Three Times Background Concentrations**

| Compound | Reference Dose Screening Concentration mg/Kg | Cancer Risk Screening Concentration mg/Kg | Maximum concentrations found in soils at the Stauffer site mg/Kg |
|---|---|---|---|
| arsenic | 170 | 0.33 | 294 |
| cadmium | 290 | --- | 15.5 |
| copper | --- | --- | 1,310 |
| mercury | 170 | --- | 30.2 |
| zinc | 120,000 | --- | 2,240 |
| alpha-BHC | --- | 0.093 | 0.15 |
| beta-BHC | --- | 0.32 | 0.036 |
| delta-BHC | --- | --- | 0.0043 |
| Lindane | 170 | 0.45 | 0.027 |
| Dieldrin | 290 | 0.036 | 0.052 |
| DDE | --- | 1.7 | 0.41 |
| DDD | --- | 2.4 | 0.17 |

## Table 6 cont.
## Hazardous Substance Benchmark Tables
## For Contaminants Found in Soils at Greater Than Three Times Background Concentrations

| Compound | Reference Dose Screening Concentration mg/Kg | Cancer Risk Screening Concentration mg/Kg | Maximum concentrations found in soils at the Stauffer site mg/Kg |
|---|---|---|---|
| DDT | 290 | 1.7 | 1.800 |
| Endrin Aldehyde | --- | --- | 0.015 |
| Chlordane | 35 | 0.45 | 0.034 |
| Arochlor-1248 (PCB) | --- | 0.076 | 0.960 |

--- = No benchmark concentrations available.

There are no benchmark concentrations available for sediment samples.

Overall Adequacy of Existing Data:

Analytical results of the 1992 URS sampling event are adequate to document an observed release to surface water at Level II concentrations of arsenic, cadmium, copper, mercury, zinc, A-BHC, B-BHC, D-BHC, Lindane, Dieldrin, DDE, DDD, DDT, Endrin ketone, Endrin Aldehyde, alpha Chlordane, gamma Chlordane, and PCBs. (An observed release is when the chemical analysis of an environmental sample from a site is found to be three or more times above the background concentration, and some portion of the release is attributable to the site.) The correlation of contamination found in on-site source areas and in surface water sediments is adequate to document this release.

Data generated for the 1987 TPCA investigation are adequate to characterize wastes found in surface impoundments. Overflow incidents involving the clarification pond and the alum mud pond were documented in 1985 and 1986. During these overflow incidents, untreated wastewater was allowed to flow directly into the adjacent tidal marsh. This information is adequate to document an observed release of site-associated contaminants to surface water by direct observation.

## *MATRIX INFORMATION SUMMARY*

**Projected HRS Score:** 59.29

**Site Name:** Stauffer Chemical Company
**Aliases:** ICI Americas Inc.
**City:** Richmond
**County:** Contra Costa
**State:** California

**Confidence:** High

**Observed Release:** Surface Water
Soil Exposure

**Level of Contamination Relative to Health-Based Benchmark:**

| *Surface Water (sediments):* | | Sample # |
|---|---|---|
| Arsenic | 1,660 mg/Kg | E-10 |
| Cadmium | 14.6 mg/Kg | E-1 |
| Copper | 1,930 mg/Kg | E-21 |
| Lead | 563 mg/Kg | E-2 |
| Mercury | 10.9 mg/Kg | E-1 |
| Zinc | 5,490mg/Kg | E-8 |
| alpha-BHC | 300 µg/Kg | E-2 |
| beta-BHC | 66 µg/Kg | E-2 |
| delta-BHC | 70 µg/Kg | E-6 |
| Lindane | 14 µg/Kg | E-2 |
| DDD | 180 µg/Kg | E-21 |
| DDE | 120 µg/Kg | E-21 |
| DDT | 370 µg/Kg | E-2 |
| Dieldrin | 37 µg/Kg | E-8 |
| Endrin ketone | 2 µg/Kg | E-5 |
| Endrin aldehyde | 18 µg/Kg | E-9 |
| alpha-Chlordane | 24 µg/Kg | E-8 |
| gamma-Chlordane | 14 µg/Kg | E-15 |
| Aroclor-1248 (PCB) | 160 µg/Kg | E-1 |

*Benchmarks:*
There are no applicable benchmarks for contaminants found in sediment samples.

| *Soil Exposure* | | Sample # |
|---|---|---|
| Arsenic | 294 mg/Kg | S-1 |
| Cadmium | 15.5 mg/Kg | S-2 |
| Copper | 1,310 mg/Kg | S-2 |
| Lead | 678 mg/Kg | S-2 |
| Mercury | 30.2 mg/Kg | S-2 |
| Zinc | 2,240 mg/Kg | S-2 |

**Level of Contamination Relative to Health-Based Benchmark cont.:**

*Soil Exposure*

| | | *Sample #* |
|---|---|---|
| alpha-BHC | 150 µg/Kg | S-2 |
| beta-BHC | 35 µg/Kg | S-2 |
| delta-BHC | 4 µg/Kg | S-6 |
| Lindane | 27µg/Kg | S-2 |
| DDD | 170 µg/Kg | S-2 |
| DDE | 410 µg/Kg | S-2 |
| DDT | 1,800 µg/Kg | S-2 |
| Dieldrin | 52 µg/Kg | S-1 |
| Endrin ketone | 7 µg/Kg | S-1 |
| Endrin aldehyde | 15 µg/Kg | S-2 |
| alpha-Chlordane | 22 µg/Kg | S-2 |
| gamma-Chlordane | 34 µg/Kg | S-2 |
| Aroclor-1248 (PCB) | 640 µg/Kg | S-2 |

*Benchmarks:*
See the following Hazardous Substance Benchmark Table (Table 7).

**Table 7**
**Hazardous Substance Benchmarks**

| Compound | Reference Dose Screening Concentration mg/Kg | Cancer Risk Screening Concentration mg/Kg | Maximum concentrations found in soils at the Stauffer site mg/Kg |
|---|---|---|---|
| arsenic | 170 | 0.33 | 294 |
| cadmium | 290 | --- | 15.5 |
| copper | --- | --- | 1,310 |
| mercury | 170 | --- | 30.2 |
| zinc | 120,000 | --- | 2,240 |
| alpha-BHC | --- | 0.093 | 0.15 |
| beta-BHC | --- | 0.32 | 0.036 |
| delta-BHC | --- | --- | 0.0043 |
| Lindane | 170 | 0.45 | 0.027 |
| Dieldrin | 290 | 0.036 | 0.052 |
| DDE | --- | 1.7 | 0.41 |
| DDD | --- | 2.4 | 0.17 |
| DDT | 290 | 1.7 | 1.800 |
| Endrin Aldehyde | --- | --- | 0.015 |
| Chlordane | 35 | 0.45 | 0.034 |
| Arochlor-1248 (PCB) | --- | 0.076 | 0.960 |

--- = No benchmark available

**Waste Type:** Cinder wastes, sedimentation pond sludge, evaporation pond sediments.

**Source/Waste Quantity:** Cinder landfill/15,000 cubic yards
Former sedimentation ponds /400,000 cubic feet
Evaporation ponds /590,000 cubic feet

**Target Population:** Surface Water:
Human Food Chain: URS estimates that 1,000,000 pounds of fish are caught on an annual basis from within 15 miles of the Stauffer site.

Soil Exposure:
URS estimates that between 1 and 100 workers may come in contact with contaminated soils at the site. Residential population within 1 mile of the site is 10,598.

**Actual Contamination:** Surface Water: (Level II)
Human Food Chain: URS estimates that approximately 2,500 pounds of fish are caught from areas adjacent to the Stauffer site within the area documented as an observed release on an annual basis.
Tidal marsh (wetland, 2 miles of frontage)
Sensitive environments (see below)

Soil Exposure: (Level II)
Sensitive environments (see below)

**Visibility:** Moderate:
Citizens for a Better Environment and the Citizens Action League has been involved with the site in the past, and the West County Toxics Coalition is active in the Richmond area.

**Sensitive Environment:** Surface Water:
California black rail (Level II)
California clapper rail (Level II)
California least tern (Level II)
California brown pelican (Level II)
salt marsh harvest mouse (Level II)
wandering shrew (Level II)
San Pablo vole (Level II)
forktail damselfly (Level II)

**Sensitive Environment:**

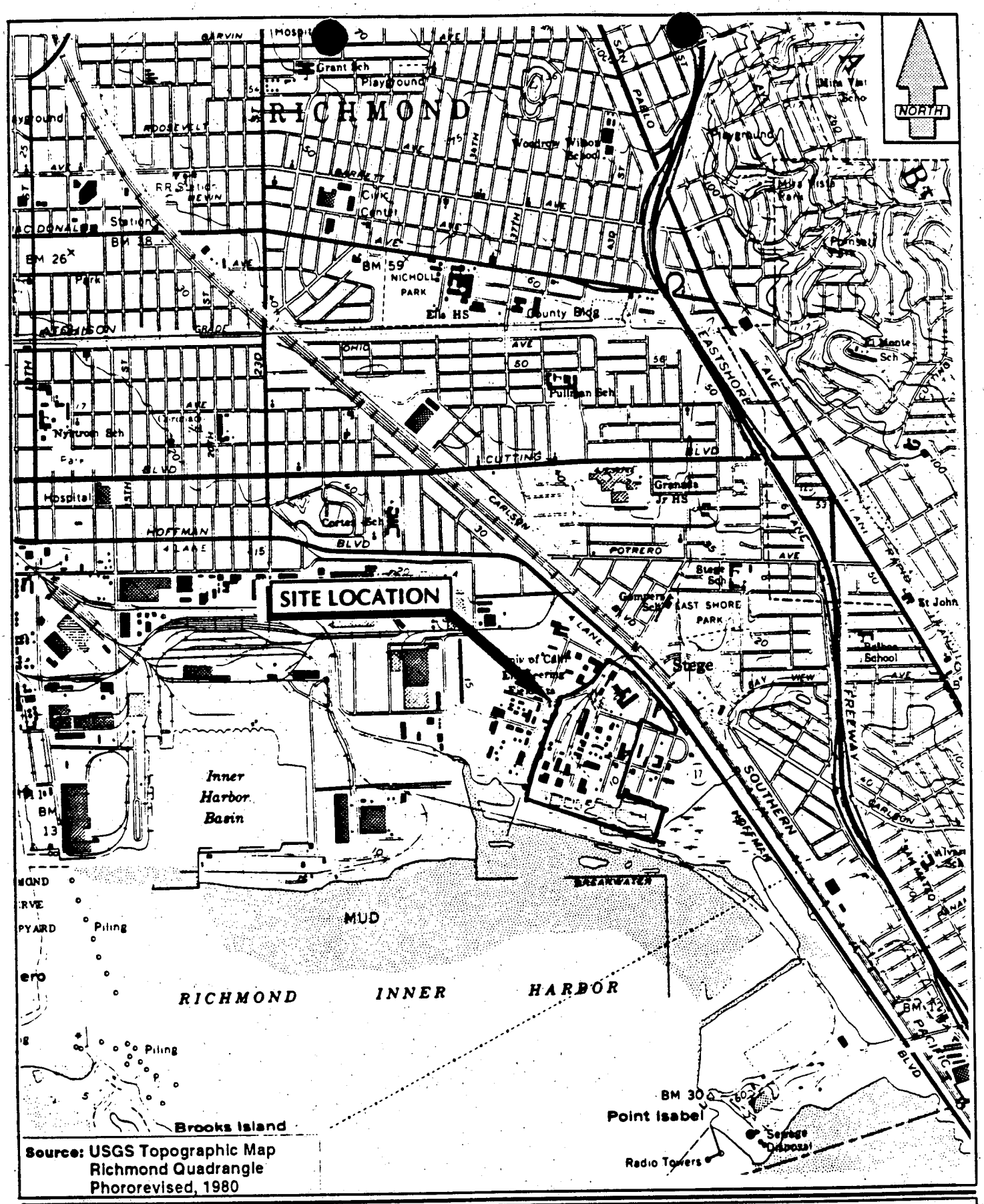
Surface Water:
Point Reyes bird's beak (Level II)
mimic tryonia (Level II)
tidewater goby

**Sensitive Environment cont:**

Soil Exposure:
California black rail (Level II)
California clapper rail (Level II)
California least tern (Level II)
California brown pelican (Level II)
salt marsh harvest mouse (Level II)
wandering shrew (Level II)
San Pablo vole (Level II)
forktail damselfly (Level II)
Point Reyes bird's beak (Level II)
mimic tryonia (Level II)

**Current State Lead:**

No current active state lead. California Regional Water Quality Control Board Bay Area Region was formerly involved in NPDES discharge monitoring, underground storage tank investigation and remediation, closure of sedimentation ponds, and solid waste assessment test of cinder landfill. Contact: Emmanual Oakereke (510) 464-0618.




Source: USGS Topographic Map
Richmond Quadrangle
Phororevised, 1980

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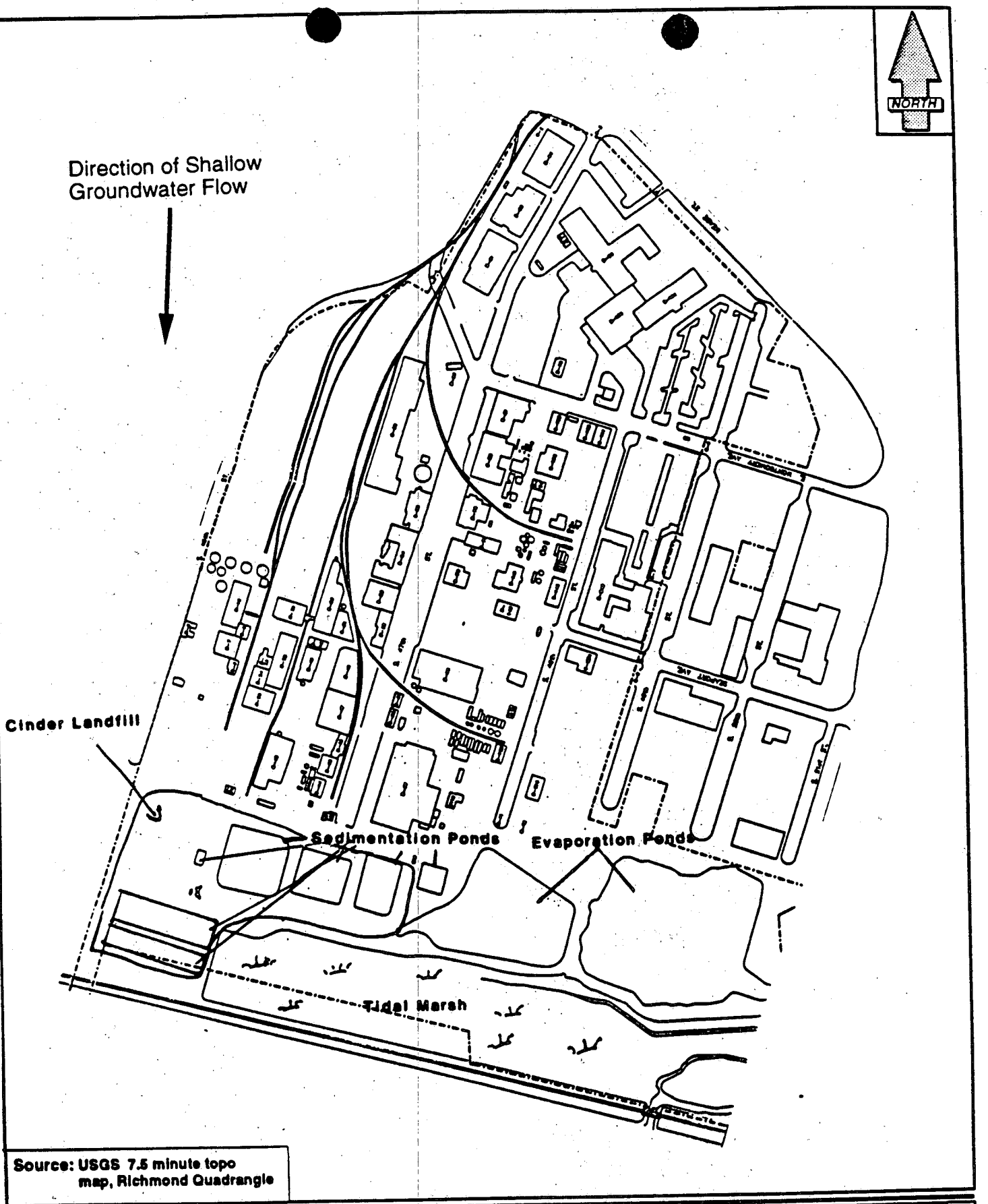
100 California Street
San Francisco, CA 94111
August 10, 1992

# Site Location Map

Stauffer Chemical Company
(ICI Americas)
Richmond, California

**FIGURE**

**2-1**




Source: USGS 7.5 minute topo map, Richmond Quadrangle

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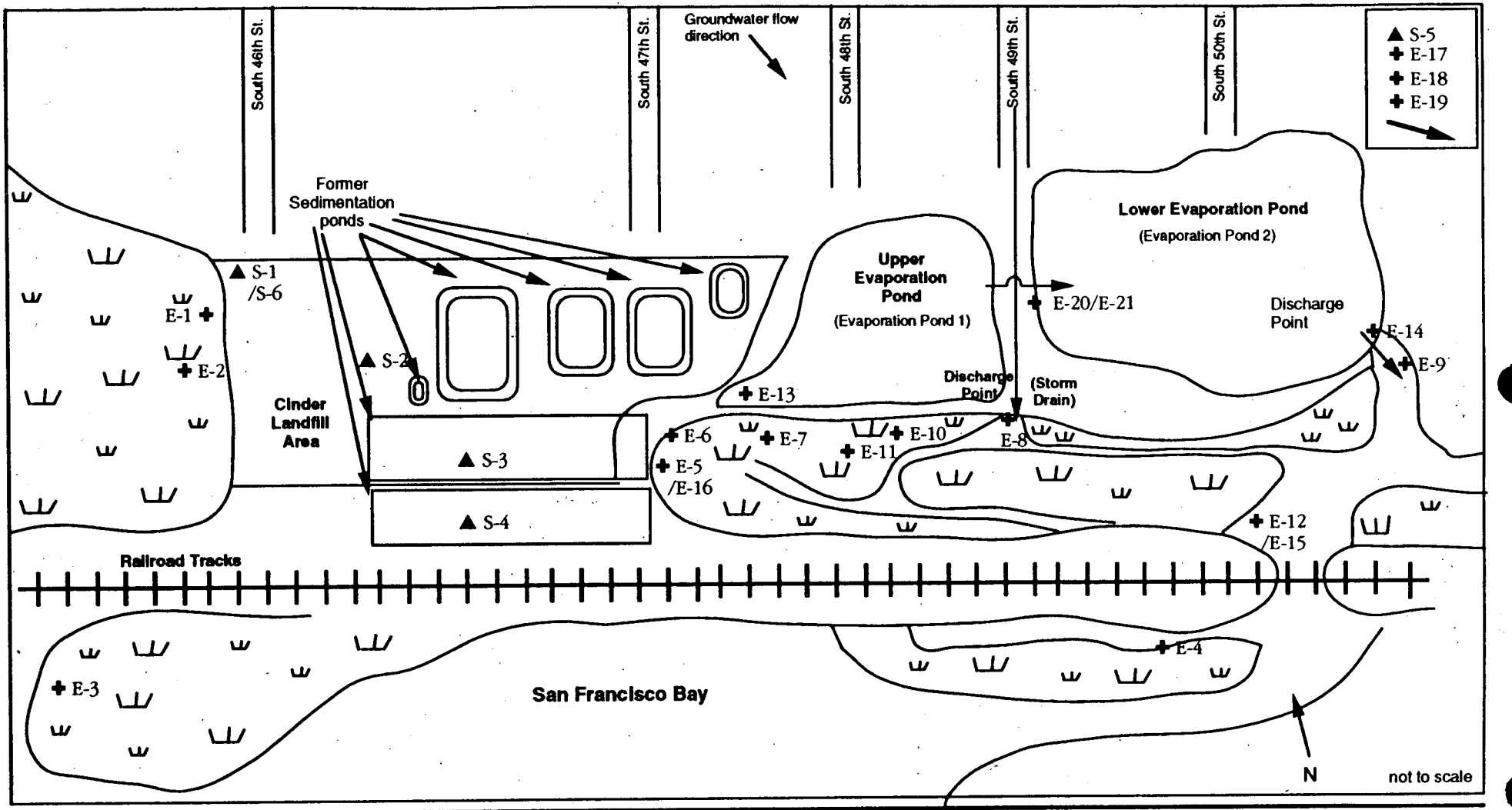
August 10, 1992

# Facility Map

Stauffer Chemical Company
(ICI Americas)
Richmond, California

FIGURE
2-2

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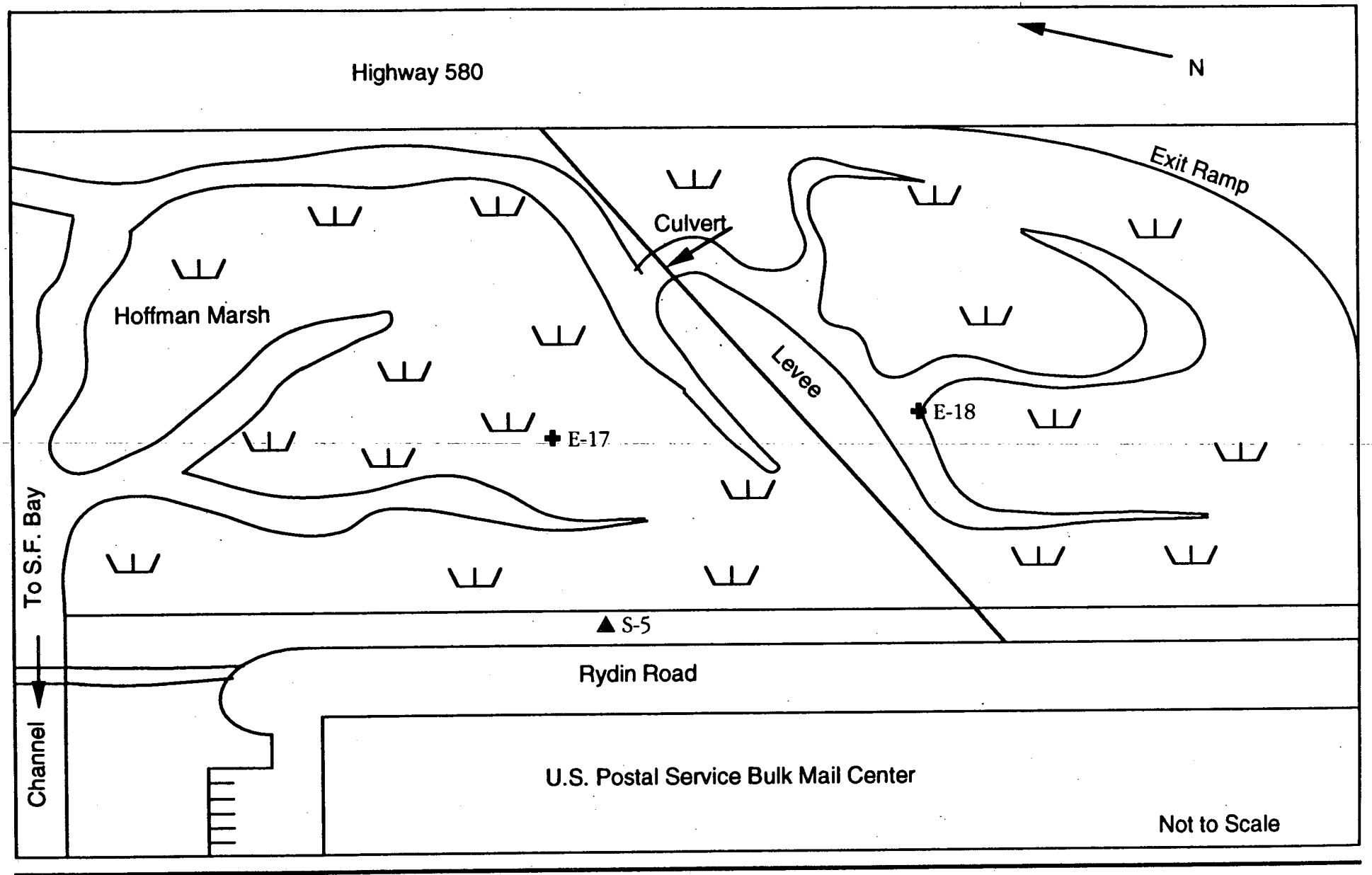
August 17, 1992

**Figure 3-1**
**Sample Location Map**
**Stauffer Chemical Company**
**Richmond, California**

Key
- E- = Sediment Sample Location
- S- = Soil Sample Location
- = Wetland Area

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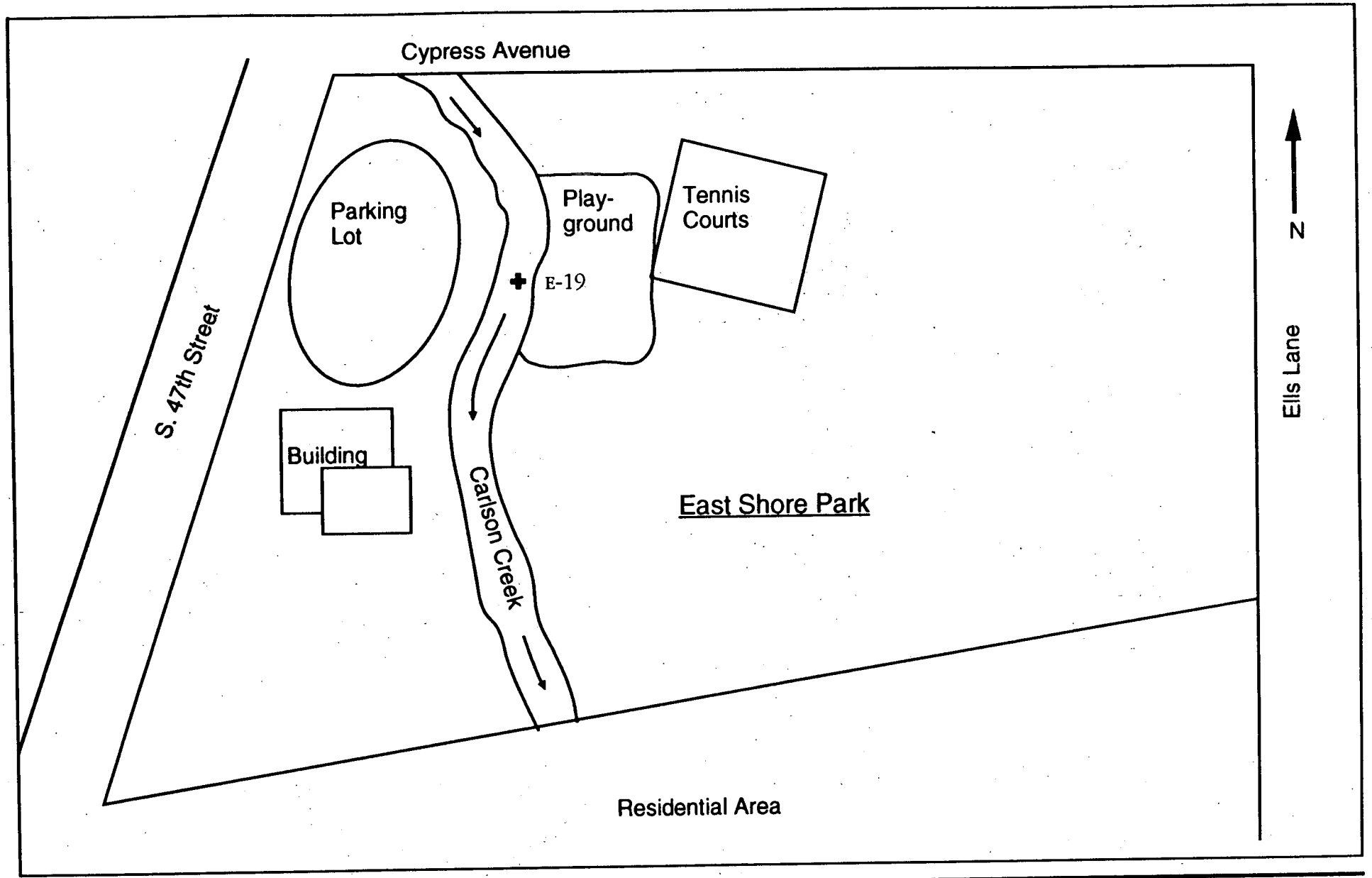
San Francisco, Ca 94111
January 25, 1993

**Figure 3-2**
**Sample Location Map**
**Stauffer Chemical Company**
**Richmond, California**

Key
- ✚ E- = Sediment Sample Location
- ▲ S- = Soil Sample Location
- ⩊ = Wetland Area




**URS Consultants**
100 California Street
San Francisco, Ca 94111
January 25, 1993

**Figure 3-3**
**Sample Location Map**
**Stauffer Chemical Company**
**Richmond, California**

Key
✚ E- = Sediment Sample Location
Not to Scale

Table 2: Metals in Richmond Water Samples; TPCA Assessment

units: ug/L

| WRC Code | Descr. (a) | Antimony | Arsenic | Barium | Beryllium | Cadmium | Chromium |
|---|---|---|---|---|---|---|---|
| 11142-3-3 | NP | <0.4 | 0.003 | <1 | <0.1 | <0.01 | <0.1 |
| 11142-3-4 | CP | <0.4 | 0.003 | <1 | <0.1 | <0.01 | <0.1 |
| 11142-3-5 | CP-R | <0.4 | 0.003 | <1 | <0.1 | <0.01 | <0.1 |
| 11142-3-7 | CCP | <0.4 | 0.002 | <1 | <0.1 | <0.01 | <0.1 |
| 11142-3-8 | AGP | <0.4 | 0.005 | <1 | <0.1 | 0.01 | <0.1 |
| 11142-19-1 | SRG | <0.4 | na(b) | <1 | <0.1 | <0.01 | <0.1 |
| STLC | | 15 | 5 | 100 | 750 ug/L | 1 | 5 |

| WRC Code | Descr. (a) | Cobalt | Copper | Fluoride | Lead | Molybedenum | Nickel |
|---|---|---|---|---|---|---|---|
| 11142-3-3 | NP | <0.2 | 0.02 | <2 | <0.04 | <0.2 | <0.02 |
| 11142-3-4 | CP | <0.2 | 0.02 | <2 | <0.04 | <0.2 | <0.02 |
| 11142-3-5 | CP-R | <0.2 | 0.02 | <2 | <0.04 | <0.2 | <0.02 |
| 11142-3-7 | CCP | <0.2 | 0.09 | <2 | <0.04 | <0.2 | 0.03 |
| 11142-3-8 | AGP | <0.2 | 1.31 | <2 | <0.04 | <0.2 | 0.08 |
| 11142-19-1 | SRG | <0.03 | 0.2 | <50 | <0.04 | <0.5 | <0.04 |
| | | 80 | 25 | | 5 | 350 | 20 |

| WRC Code | Descr. (a) | Selenium | Silver | Thallium | Vanadium | Zinc |
|---|---|---|---|---|---|---|
| 11142-3-3 | NP | <0.4 | <0.01 | <0.2 | <0.5 | 0.05 |
| 11142-3-4 | CP | <0.4 | <0.01 | <0.2 | <0.5 | 0.03 |
| 11142-3-5 | CP-R | <0.4 | <0.01 | <0.2 | <0.5 | 0.03 |
| 11142-3-7 | CCP | <0.4 | <0.01 | <0.2 | <0.5 | 0.37 |
| 11142-3-8 | AGP | <0.4 | <0.01 | <0.2 | <0.5 | 5.43 |
| 11142-19-1 | SRG | <0.4 | na(b) | <0.2 | <0.3 | 0.35 |
| | | 1 | 5 | 7 | 24 | 250 |

a) NP = Neutralization Pond, CP = Clarification Pond, CCP = Carbon Column Pond, AGP = Ag Yard Pond, SRG = Surge Pond, R = replicate sample

b) Not analyzed for this component

Table 3: Metals in Richmond Sludge Samples - Method 3050, Total Metals; TPCA Assessment

units: mg/kg

| Sample #(a) | Descr.(b) | Antimony | Arsenic | Barium | Beryllium | Cadmium | Chromium |
|---|---|---|---|---|---|---|---|
| 11142-9-1 | NP-SLG-1 | 12.3 | 53 * | 123 * | <0.3 | 1 | 12.3 |
| 11142-9-2 | NP-SLG-1R | 8.4 | 48 * | 84 | 0.2 | 2 * | 16.9 |
| 11142-9-3 | NP-SLG-2 | 9.2 | 60 * | 69 | <0.2 | 3 * | 11.6 |
| 11142-9-3R | NP-SLG-2 | 9.2 | na(c) | 69 | <0.2 | 3 * | 13.7 |
| 11142-9-5 | SRG-SLG-1 | 10.6 | 15 * | 27 | <0.3 | 2 * | 5.3 |
| 11142-9-6 | SRG-SLG-1R | 9.6 | 8.2 * | 24 | <0.2 | 2 * | 7.2 |
| 11142-9-7 | SRG-SLG-2 | 10.5 | 13 * | 26 | <0.3 | 3 * | 7.9 |
| 11142-9-9 | SRG-SLG-3 | 10.1 | 10 * | 25 | 0.3 | 4 * | 12.6 |
| 11142-9-9R | SRG-SLG-3 | 12.0 | na | 30 | <0.3 | 4 * | 12.0 |
| 11142-9-10 | SRG-SLG-4 | 9.6 | 11 * | 24 | 0.2 | 3 * | 9.6 |
| 11142-9-11 | CCP-SLG-1 | 12.2 | 3.9 | 30 | 0.3 | 9 * | 9.1 |
| 11142-9-12 | CCP-SLG-3 | 9.8 | 2.7 | 49 | 0.3 | 24 * | 14.7 |
| 11142-9-12R | CCP-SLG-3 | na | 2.7 | na | na | na | na |
| 11142-9-13 | CCP-SLG-4 | 8.3 | 7.4 * | 125 * | 0.2 | 10 * | 24.9 |
| 11142-9-13R | CCP-SLG-4 | 10.5 | na | 79 | 0.3 | 10 * | 21.0 |
| 11142-9-14 | AGP-SLG-1 | 22.0 * | 14 * | 110 * | 1.6 * | 34 * | 11.0 |
| 11142-9-15 | AGP-SLG-2 | 11.0 | 6.7 * | 55 | 1.1 * | 17 * | 11.0 |
| 11142-9-15R | AGP-SLG-2 | 16.7 * | 8.8 * | 84 | 0.8 * | 17 * | 12.6 |
| 11131-39-1 | EV2-SLG-1 | <13 | 59 * | 108 * | 0.3 | 2.2 * | 57 |
| 11131-39-1R | EV2-SLG-1 | <13 | na | 92 | 0.3 | 2.2 * | 52 |
| 11131-39-2 | EV2-SLG-2 | <13 | 159 * | 86 | <0.3 | 3.2 * | 38 |
| 11131-39-3 | EV2-SLG-3 | <13 | 124 * | 144 * | <0.3 | 3.5 * | 62 |
| 11131-39-3R | EV2-SLG-3 | na | 119 * | na | na | na | na |
| 11131-39-4 | EV2-SLG-4 | <13 | na | 123 * | 0.3 | 1.3 * | 58 |
| 11131-39-4R | EV2-SLG-4 | <13 | 23 * | 116 * | 0.3 | 1.2 * | na |
| 11131-42-1 | EV1-SLG-1 | <13 | 196 * | 23 | <0.3 | 7.6 * | 16 |
| 11131-42-2 | EV1-SLG-2 | <13 | 157 * | 31 | <0.3 | 9.4 * | 6 |
| 11131-42-2R | EV1-SLG-2 | <13 | na | 65 | <0.3 | 9.3 * | 5 |
| 11131-42-3 | EV1-SLG-3 | <13 | 208 * | 48 | <0.3 | 6.7 * | 17 |
| 11131-42-4 | EV1-SLG-4 | <13 | 14 * | 46 | <0.3 | 1.5 * | 9 |
| 11131-42-4R | EV1-SLG-4 | na | 15 * | na | na | na | na |
| TTLC(d) | | 500 | 500 | 10000 | 75 | 100 | ~~2500~~ |
| STLC(e) | | 15 | 5 | 100 | 0.75 | 1 | ~~560~~ |

a) R = replicate analysis
b) NP = Neutralization Pond, SRG = Surge Pond, CCP = Carbon Column Pond AGP = Ag Yard Pond, EV1 = Evaporation Pond 1, EV2 = Evaporation Pond 2, R = replicate sample
c) na = Not Analyzed
d) TTLC = Total Threshold Limit Concentration Values
e) STLC = Soluble Threshold Limit Concentration Values

* [ ] > STLC

Table 3: Metals in Richmond Sludge Samples - Method 3050, Total Metals; TPCA Assessment (Continued)

| Sample #(a) | Descr.(b) | Cobalt | Copper | Lead | Molybdenum | Nickel |
|---|---|---|---|---|---|---|
| | | units: mg/kg | | | | |
| 11142-9-1 | NP-SLG-1 | 9 | 264 | 344 | 6 | 12 |
| 11142-9-2 | NP-SLG-1R | 6 | 328 | 266 | 15 | 15 |
| 11142-9-3 | NP-SLG-2 | 5 | 429 | 522 | 9 | 14 |
| 11142-9-3R | NP-SLG-2 | 5 | 371 | 236 | 7 | 14 |
| 11142-9-5 | SRG-SLG-1 | 5 | 210 | 18 | <3 | 11 |
| 11142-9-6 | SRG-SLG-1R | 5 | 202 | 17 | <3 | 12 |
| 11142-9-7 | SRG-SLG-2 | 8 | 412 | 134 | <3 | 16 |
| 11142-9-9 | SRG-SLG-3 | 10 | 452 | 43 | 5 | 23 |
| 11142-9-9R | SRG-SLG-3 | 9 | 456 | 42 | 6 | 23 |
| 11142-9-10 | SRG-SLG-4 | 7 | 340 | 26 | <3 | 12 |
| 11142-9-11 | CCP-SLG-1 | 18 | 486 | 128 | <6 | 33 |
| 11142-9-12 | CCP-SLG-3 | 15 | 999 | 140 | 5 | 34 |
| 11142-9-13 | CCP-SLG-4 | 17 | 834 | 193 | 10 | 46 |
| 11142-9-13R | CCP-SLG-4 | 16 | 736 | 152 | 5 | 37 |
| 11142-9-14 | AGP-SLG-1 | 27 | 10631 | 55 | 11 | 55 |
| 11142-9-15 | AGP-SLG-2 | 17 | 6984 | 72 | 17 | 33 |
| 11142-9-15R | AGP-SLG-2 | 13 | 5944 | 71 | 13 | 33 |
| 11131-39-1 | EV2-SLG-1 | 8 | 270 | 76 | 14 | 45 |
| 11131-39-1R | EV2-SLG-1 | 8 | 272 | 76 | 14 | 44 |
| 11131-39-2 | EV2-SLG-2 | 4 | 405 | 83 | 10 | 26 |
| 11131-39-3 | EV2-SLG-3 | 5 | 570 | 130 | 14 | 39 |
| 11131-39-4 | EV2-SLG-4 | 10 | 172 | 68 | 16 | 47 |
| 11131-39-4R | EV2-SLG-4 | 9 | 181 | 67 | 15 | 46 |
| 11131-42-1 | EV1-SLG-1 | 2 | 554 | 143 | 12 | 12 |
| 11131-42-2 | EV1-SLG-2 | 2 | 649 | 109 | 10 | 12 |
| 11131-42-2R | EV1-SLG-2 | 2 | 599 | 106 | 14 | 11 |
| 11131-42-3 | EV1-SLG-3 | 2 | 557 | 131 | 14 | 14 |
| 11131-42-4 | EV1-SLG-4 | 1 | 148 | 56 | 15 | 13 |
| TTLC(c) | | 8000 | 2500 | 1000 | 3500 | 2000 |
| STLC(d) | | 80 | 25 | 5 | 350 | 20 |

a) R = replicate analysis
b) NP = Neutralization Pond, SRG = Surge Pond, CCP = Carbon Column Pond AGP = Ag Yard Pond, EV1 = Evaporation Pond 1, EV2 = Evaporation Pond 2, R = replicate sample
c) TTLC = Total Threshold Limit Concentration Values
d) STLC = Soluble Threshold Limit Concentration Values

Table 3: Metals in Richmond Sludge Samples - Method 3050, Total Metals; TPCA Assessment (Continued)

| | | units: mg/kg | | | | |
|---|---|---|---|---|---|---|
| Sample #(a) | Descr.(b) | Selenium | Silver | Thallium | Vanadium | Zinc |
| 11142-9-1 | NP-SLG-1 | 49 | 2.8 | <0.3 | 34 | 442 |
| 11142-9-2 | NP-SLG-1R | 19 | 2.1 | <0.3 | 36 | 427 |
| 11142-9-3 | NP-SLG-2 | 67 | 2.3 | <0.3 | 32 | 448 |
| 11142-9-3R | NP-SLG-2 | 14 | 2.1 | <0.3 | 27 | 448 |
| 11142-9-5 | SRG-SLG-1 | 21 | <0.3 | <0.3 | <15 | 364 |
| 11142-9-6 | SRG-SLG-1R | 7.2 | 0.2 | <0.3 | <15 | 353 |
| 11142-9-7 | SRG-SLG-2 | 16 | 0.3 | <0.3 | <15 | 778 |
| 11142-9-9 | SRG-SLG-3 | 20 | <0.3 | <0.3 | <15 | 802 |
| 11142-9-9R | SRG-SLG-3 | 24 | <0.3 | <0.3 | <15 | 832 |
| 11142-9-10 | SRG-SLG-4 | 24 | 0.2 | <0.3 | <15 | 592 |
| 11142-9-11 | CCP-SLG-1 | 18 | 2.7 | <0.3 | <15 | 7275 |
| 11142-9-12 | CCP-SLG-3 | 20 | 6.4 | <0.3 | <15 | 4440 |
| 11142-9-13 | CCP-SLG-4 | 17 | 5.4 | <0.3 | 21 | 3509 |
| 11142-9-13R | CCP-SLG-4 | 11 | 5.3 | <0.3 | 24 | 3205 |
| 11142-9-14 | AGP-SLG-1 | 44 | <0.5 | <0.3 | 55 | 10099 |
| 11142-9-15 | AGP-SLG-2 | 25 | <0.3 | <0.3 | 39 | 5238 |
| 11142-9-15R | AGP-SLG-2 | 17 | <0.4 | <0.3 | 38 | 4856 |
| 11131-39-1 | EV2-SLG-1 | 16 | <0.5 | <6 | 43 | 602 |
| 11131-39-1R | EV2-SLG-1 | 16 | <0.5 | <6 | 52 | 571 |
| 11131-39-2 | EV2-SLG-2 | 10 | 0.6 | <6 | 36 | 550 |
| 11131-39-3 | EV2-SLG-3 | 14 | 1.1 | <6 | 57 | 654 |
| 11131-39-4 | EV2-SLG-4 | 16 | <0.6 | <6 | 49 | 383 |
| 11131-39-4R | EV2-SLG-4 | 28 | <0.6 | <6 | 40 | 383 |
| 11131-42-1 | EV1-SLG-1 | 18 | 1.2 | <6 | 21 | 1235 |
| 11131-42-2 | EV1-SLG-2 | 13 | 1.7 | <6 | 15 | 1150 |
| 11131-42-2R | EV1-SLG-2 | 22 | 1.6 | <6 | 14 | 1122 |
| 11131-42-3 | EV1-SLG-3 | 36 | 1.9 | <6 | 28 | 888 |
| 11131-42-4 | EV1-SLG-4 | 18 | <0.6 | <6 | 21 | 214 |
| TTLC(c) | | 100 | 500 | 700 | 2400 | 5000 |
| STLC(d) | | 1 | 5 | 7 | 24 | 250 |

a) R = replicate analysis
b) NP = Neutralization Pond, SRG = Surge Pond, CCP = Carbon Column Pond AGP = Ag Yard Pond, EV1 = Evaporation Pond 1, EV2 = Evaporation Pond 2, R = replicate sample
c) TTLC = Total Threshold Limit Concentration Values
d) STLC = Soluble Threshold Limit Concentration Values

Table 4: Richmond Sludge Samples - Wet Test Results; TPCA Assessment

| Sample #(a) | Descr.(b) | Arsenic | Cadmium | Chromium | Copper | Lead | Fluoride | Selenium | Zinc |
|---|---|---|---|---|---|---|---|---|---|
| | | units: mg/L | | | | | | | |
| 11142-9-1 | NP-SLG-1 | 0.9 | na(c) | na | 0.06 | 18.2 | 60 | 0.4 | na |
| 11142-9-1R | NP-SLG-1 | 0.9 | na | na | 0.06 | 5.4 | 50 | 0.5 | na |
| 11142-9-2 | NP-SLG-1R | 1.3 | na | na | 0.03 | 3.2 | 100 | 0.4 | na |
| 11142-9-3 | NP-SLG-2 | 1.6 | na | na | <0.03 | 2.8 | 60 | <0.4 | na |
| 11142-9-5 | SRG-SLG-1 | na | na | na | 0.05 | 0.6 | 70 | <0.4 | na |
| 11142-9-6 | SRG-SLG-1R | na | na | na | 0.21 | 0.7 | 100 | 0.7 | 23 |
| 11142-9-7 | SRG-SLG-2 | na | na | na | 0.31 | 0.9 | 190 | <0.3 | na |
| 11142-9-9 | SRG-SLG-3 | na | na | na | 11.4 | 0.5 | 180 | <0.3 | na |
| 11142-9-10 | SRG-SLG-4 | na | na | na | 0.4 | 0.05 | 80 | <0.5 | na |
| 11142-9-11 | CCP-SLG-1 | na | <0.02 | na | <0.04 | 0.04 | 30 | <0.5 | 106 |
| 11142-9-12 | CCP-SLG-3 | na | <0.02 | na | <0.04 | <0.05 | 30 | 0.6 | 0.1 |
| 11142-9-13 | CCP-SLG-4 | na | <0.02 | na | <0.04 | <0.05 | 40 | 0.6 | 3.6 |
| 11142-9-14 | AGP-SLG-1 | na | 0.9 | na | 600 | 0.13 | 310 | 1.1 | 196 |
| 11142-9-15 | AGP-SLG-2 | na | 0.9 | na | 360 | 0.2 | 120 | <0.5 | 279 |
| 11131-39-1 | EV2-SLG-1 | 0.7 | na | 1.3 | 0.04 | 0.2 | 140 | <0.2 | na |
| 11131-39-1R | EV2-SLG-1 | 0.7 | na | 1.3 | 0.03 | 0.2 | 130 | <0.2 | na |
| 11131-39-2 | EV2-SLG-2 | 9.0 | na | 2.8 | 0.14 | 3.0 | 140 | 0.2 | na |
| 11131-39-3 | EV2-SLG-3 | 4.1 | na | 3.1 | 0.04 | 0.9 | 120 | 0.5 | na |
| 11131-39-4 | EV2-SLG-4 | 0.9 | na | 0.8 | 0.04 | 55 | 80 | 0.3 | na |
| 11131-42-1 | EV1-SLG-1 | 7.0 | na | na | 0.04 | 3.4 | 150 | 0.4 | na |
| 11131-42-2 | EV1-SLG-2 | 7.8 | na | 0.4 | 11 | 2.9 | 90 | <0.3 | na |
| 11131-42-3 | EV1-SLG-3 | 7.4 | na | na | 3.3 | 2.4 | 100 | 0.4 | na |
| 11131-42-4 | EV1-SLG-4 | 0.5 | na | na | 0.9 | 1.8 | 70 | 0.4 | na |
| TTLC(d) | | 500 | 100 | 2500 | 2500 | 1000 | 18000 | 100 | 5000 |
| STLC(e) | | 5 | 1 | 560 | 25 | 5 | 180 | 1 | 250 |

a) R = replicate analysis

b) NP = Neutralization Pond, SRG = Surge Pond, CCP = Carbon Column Pond, AGP = Ag Yard Pond, EV1 = Evaporation Pond 1, EV2 = Evaporation Pond 2, R = replicate sample

c) na = Not analyzed - analysis not required based on total concentration of metal

d) TTLC = Total Threshold Limit Concentration Values

e) STLC = Soluble Threshold Limit Concentration Values

Table 5: Proprietary Pesticides in Water Samples; TPCA Assessment

units: mg/L

| WRC Code | Descr.(a) | EPTC | Butylate | Vernolate | Pebulate |
|---|---|---|---|---|---|
| 11142-3-3 | NP | <0.001 | <0.001 | <0.001 | <0.001 |
| 11142-3-4 | CP | <0.001 | <0.001 | <0.001 | <0.001 |
| 11142-3-5 | CP-R | <0.001 | <0.001 | <0.001 | <0.001 |
| 11142-3-7 | CCP | 0.050 | 0.001 | 0.005 | 0.021 |
| 11142-3-8 | AGP | 0.19 | 0.002 | 0.017 | 0.089 |
| 11142-19-1 | SRG | <0.001 | <0.001 | <0.001 | <0.001 |
| 11131-18-1 | EV1 | <0.001 | <0.001 | <0.001 | <0.001 |
| 11131-19-1 | EV2 | <0.001 | <0.001 | <0.001 | <0.001 |

| WRC Code | Descr.(a) | Molinate | Cycloate | Napropamide | VAPAM(b) |
|---|---|---|---|---|---|
| 11142-3-3 | NP | <0.001 | <0.001 | 0.002 | <0.001 |
| 11142-3-4 | CP | <0.001 | <0.001 | <0.001 | <0.001 |
| 11142-3-5 | CP-R | <0.001 | <0.001 | <0.001 | <0.001 |
| 11142-3-7 | CCP | 0.34 | 0.007 | 0.014 | <0.001 |
| 11142-3-8 | AGP | 0.95 | 0.026 | 0.007 | <0.001 |
| 11142-19-1 | SRG | <0.001 | <0.001 | <0.001 | <0.009 |
| 11131-18-1 | EV1 | <0.001 | <0.001 | <0.001 | <0.009 |
| 11131-19-1 | EV2 | <0.001 | <0.001 | <0.001 | <0.009 |

a) NP = Neutralization Pond, SRG = Surge Pond, CCP = Carbon Column Pond AGP = Ag Yard Pond, EV1 = Evaporation Pond 1 Influent, EV2 = Evaporation Pond 2 Influent, CP = Clarification Pond, R = replicate sample

b) Analyzed as the hydrolysis product: methylisothiocyanate; reported as Vapam.

Anal. Ref.: 11142-1

Table 6: Proprietary Pesticides in Sludge Samples; TPCA Assessment

units: mg/kg

| WRC Code(a) | Descr.(b) | EPTC | Butylate | Vernolate | Pebulate | Molinate | Cycloate | Napropamid | VAPAM(c) |
|---|---|---|---|---|---|---|---|---|---|
| 11142-9-1 | NP-SLG-1 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.14 | <0.002 |
| 11142-9-2 | NP-SLG-1R | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.12 | <0.002 |
| 11142-9-3 | NP-SLG-2 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.14 | <0.002 |
| 11142-9-3R | NP-SLG-2 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.17 | <0.002 |
| 11142-9-5 | SRG-SLG-1 | 0.27 | 0.02 | 0.03 | 0.11 | 3.80 | 0.04 | 0.24 | <0.002 |
| 11142-9-7 | SRG-SLG-2 | <0.08 | <0.08 | <0.08 | <0.08 | 0.45 | <0.08 | 0.57 | <0.002 |
| 11142-9-9 | SRG-SLG-3 | 0.04 | <0.04 | <0.04 | <0.04 | 0.05 | <0.04 | 0.56 | <0.002 |
| 11142-9-10 | SRG-SLG-4 | <0.08 | <0.08 | <0.08 | <0.08 | <0.08 | <0.08 | 0.23 | <0.002 |
| 11142-9-11 | CCP-SLG-1 | 34.6 | 2.47 | 4.62 | 8.61 | 48.4 | 4.90 | 128 | 3.54 |
| 11142-9-12R | CCP-SLG-3 | 2.89 | 3.65 | 1.06 | 2.31 | 2.84 | 1.19 | 260 | 1.13 |
| 11142-9-13 | CCP-SLG-4 | 1.06 | 1.01 | 0.39 | 0.65 | 1.66 | 0.34 | 91.8 | 0.42 |
| 11142-9-14 | AGP-SLG-1 | 0.46 | 0.01 | 0.10 | 0.86 | 4.68 | 0.38 | 0.32 | <0.002 |
| 11142-9-15 | AGP-SLG-2 | 0.54 | 0.059 | 0.24 | 1.97 | 7.12 | 0.73 | 1.09 | <0.002 |
| 11131-42-1 | EV1-SLG-1 | <0.02 | 0.02 | <0.02 | 0.37 | <0.02 | 0.03 | 0.29 | 0.47 |
| 11131-42-2 | EV1-SLG-2 | <0.02 | <0.02 | <0.02 | 0.08 | <0.02 | 0.03 | 0.20 | 0.22 |
| 11131-42-3 | EV1-SLG-3 | 0.13 | <0.02 | <0.02 | 0.38 | 0.02 | 0.04 | 0.53 | <0.02 |
| 11131-42-4 | EV1-SLG-4 | <0.02 | 0.02 | <0.02 | <0.02 | <0.02 | <0.02 | 0.78 | <0.02 |
| 11131-39-1 | EV2-SLG-1 | 2.3 | <0.02 | 0.84 | 2.3 | 4.7 | 0.68 | 0.46 | <0.02 |
| 11131-39-2 | EV2-SLG-2 | 2.1 | <0.02 | 5.5 | 9.3 | 1.2 | 7.4 | 2.1 | <0.02 |
| 11131-39-3 | EV2-SLG-3 | 210 | 4.0 | 76 | 280 | 250 | 29 | 58 | <0.02 |
| 11131-39-4 | EV2-SLG-4 | 0.67 | <0.02 | 0.20 | 0.76 | 0.66 | <0.02 | <0.02 | <0.02 |

a) R = replicate analysis

b) NP = Neutralization Pond, SRG = Surge Pond, CCP = Carbon Column Pond, AGP = Ag Yard Pond, EV1 = Evaporation Pond 1, EV2 = Evaporation Pond 2, R = replicate sample

c) Analyzed as the hydrolysis product: methylisothiocyanate; reported as Vapam.

Table 7: Volatile Aromatics (EPA Method 8020) in Water Samples; TPCA Assessment(a)

units: mg/L

| WRC Code | Descr. (b) | Benzene | Toluene | Chloro-benzene | Ethyl benzene | Xylenes m- & p- | Xylenes o- | Dichlorobenzenes 1,3 | Dichlorobenzenes 1,4- | Dichlorobenzenes 1,2- |
|---|---|---|---|---|---|---|---|---|---|---|
| 11142-6-5 | NP-1 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 11142-6-6 | NP-2 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 11142-6-7 | NP-3 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 11142-6-8 | NP-4 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 11142-6-9 | CP-1 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 11142-6-10 | CP-1R | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 11142-6-12 | CP-2 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 11142-6-13 | CP-3 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 11142-6-14 | CP-4 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 11142-6-15 | CCP-1 | <0.01 | <0.01 | <0.01 | <0.01 | 0.09 | 0.05 | <0.01 | <0.01 | <0.01 |
| 11142-6-16 | CCP-1R | <0.01 | <0.01 | <0.01 | <0.01 | 0.07 | 0.06 | <0.01 | 0.02 | <0.01 |
| 11142-6-18 | CCP-2 | <0.01 | <0.01 | <0.01 | <0.01 | 0.09 | 0.06 | <0.01 | <0.01 | <0.01 |
| 11142-6-19 | CCP-3 | <0.01 | <0.01 | <0.01 | <0.01 | 0.08 | 0.05 | <0.01 | <0.01 | <0.01 |
| 11142-6-20 | CCP-4 | <0.01 | <0.01 | <0.01 | <0.01 | 0.07 | 0.05 | <0.01 | <0.01 | <0.01 |
| 11142-6-21 | AGP-1 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 11142-6-22 | AGP-2 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 11142-6-23 | AGP-3 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 11142-6-24 | AGP-4 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |

a) Surge pond was not sampled for this analysis because there was no water in the pond at the time these samples were taken. When water was put into the pond, it was sampled and analyzed for all purable priority pollutants.

b) NP = Neutralization Pond, CCP = Carbon Column Pond, AGP = Ag Yard Pond, CP = Clarification Pond, R = replicate sample

Analytical Reference 11130-12 to 21,27

Table 8: Volatile Aromatics (EPA Method 8020) in Sludge Samples; TPCA Assesment

units: mg/g

| WRC Code(a) | Descr.(b) | Benzene | Toluene | Chloro-benzene | Ethyl benzene | Xylenes m- & p- | Xylenes o- | Dichlorobenzenes 1,3- | Dichlorobenzenes 1,4 | Dichlorobenzenes 1,2- |
|---|---|---|---|---|---|---|---|---|---|---|
| 11142-9-1 | NP-SLG-1 | <0.1 | 0.5 | <0.1 | <0.1 | <0.1 | <0.1 | 0.4 | 0.6 | 0.7 |
| 11142-9-2 | NP-SLG-1R | <0.1 | 0.2 | <0.1 | <0.1 | <0.1 | <0.1 | 0.4 | <0.1 | <0.1 |
| 11142-9-3 | NP-SLG-2 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| 11142-9-3R | NP-SLG-2 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| 11142-9-5 | SRG-SLG-1 | 22 | 4.6 | 0.7 | 0.3 | 0.4 | 0.1 | 0.1 | <0.1 | 0.1 |
| 11142-9-5R | SRG-SLG-1 | 9 | 2.0 | 0.4 | 0.2 | 0.3 | 0.1 | <0.1 | 0.4 | <0.1 |
| 11142-9-7 | SRG-SLG-2 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| 11142-9-9 | SRG-SLG-3 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| 11142-9-10 | SRG-SLG-4 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| 11142-9-11 | CCP-SLG-1 | 14 | 204 | 12.3 | 1.0 | 4.2 | 0.5 | <0.1 | <0.1 | <0.1 |
| 11142-9-11R | CCP-SLG-1 | 8 | 111 | 7.3 | 0.6 | 2.6 | 0.3 | 0.8 | <0.1 | <0.1 |
| 11142-9-11R | CCP-SLG-1 | 9 | 114 | 7.3 | 0.6 | 2.5 | 0.2 | 0.6 | 0.2 | <0.1 |
| 11142-9-12 | CCP-SLG-3 | <0.1 | 1.7 | 0.3 | <0.1 | 0.2 | <0.1 | 3.2 | <0.1 | <0.1 |
| 11142-9-13 | CCP-SLG-4 | 0.1 | 4.2 | 0.8 | <0.1 | 0.3 | 0.1 | 1.2 | 1.9 | 2.0 |
| 11142-9-14 | AGP-SLG-1 | <0.1 | <0.1 | 0.2 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| 11142-9-15 | AGP-SLG-2 | <0.1 | <0.1 | 0.3 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |

a) R = replicate analysis

b) NP = Neutralization Pond, SRG = Surge Pond, CCP = Carbon Column Pond
AGP = Ag Yard Pond, R = replicate sample

Table 9: Purgable Priority Pollutants in Water; TPCA Assessment(a)

units: µg/L

| WRC Code | Descr. (b) | 1,1-Dichloroethane | 1,1-Dichloroethylene | 1,1-Dichloroethane | Benzene | Chlorobenzene | Carbon Tetrachloride | Chloroform | Ethyl Benzene | Methylene Chloride | Tetrachloroethylene | Trichloroethylene | Toluene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11131-18-1 | EV1 | <1 | <1 | 29 | <1 | <1 | <1 | <1 | <1 | <1 | 2 | <1 | <1 |
| 11131-19-1 | EV2 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| 11131-20-1 | CCP-1 | <10 | <10 | 50 | 50 | 30 | <10 | 40 | <10 | 1100 | <10 | <10 | <10 |
| 11131-23-1 | CCP-1R | <1 | 1 | 49 | 51 | 39 | 3 | 44 | <1 | 1400 | 7 | 11 | 1000 |
| 11131-20-2 | CCP-2 | <1 | <1 | 57 | 39 | 46 | 2 | 35 | <1 | 2200 | 6 | 10 | 110 |
| 11131-20-3 | CCP-3 | <1 | <1 | 53 | 40 | 23 | 3 | 47 | 1 | 1700 | 4 | 7 | 470 |
| 11131-20-4 | CCP-4 | <1 | <1 | 51 | 41 | 22 | 3 | 43 | <1 | 1700 | 4 | 7 | 450 |
| 11131-22-1 | AGP-1 | <10 | <10 | <10 | <10 | 130 | <10 | <10 | <10 | <10 | 10 | 20 | <10 |
| 11131-22-2 | AGP-2 | <50 | <50 | <50 | <50 | 250 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| 11131-22-3 | AGP-3 | <10 | <10 | <10 | 10 | 250 | <10 | <10 | <10 | <10 | 30 | 40 | <10 |
| 11131-22-4 | AGP-4 | <10 | <10 | 40 | 10 | 260 | <10 | <10 | <10 | <10 | 20 | 40 | 20 |
| 11131-26-1 | NP-1 | <10 | <10 | 40 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 |
| 11131-27-1 | NP-1R | <10 | <10 | 30 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 |
| 11131-26-2 | NP-2 | <10 | <10 | 40 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 |
| 11131-26-3 | NP-3 | <10 | <10 | 40 | <10 | <10 | <10 | <10 | <10 | <10 | 10 | <10 | <10 |
| 11131-26-4 | NP-4 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 |
| 11131-25-1 | CP-1 | <10 | <10 | 30 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 |
| 11131-25-2 | CP-2 | 30 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 |
| 11131-25-3 | CP-3 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 |
| 11131-25-4 | CP-4 | 30 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 |
| 11142-20-1 | SRG-1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| 11142-20-2 | SRG-2 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| 11142-20-3 | SRG-3 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| 11142-20-4 | SRG-4 | 3 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |

a) Analytes quantitated by Method 624 where a response above detection limit was recorded for at least one of the samples are listed in the table. Analyses were performed by Brown and Caldwell Laboratories.

b) NP = Neutralization Pond, SRG = Surge Pond, CCP = Carbon Column Pond, CP = Clarification Pond, AGP = Ag Yard Pond, EV1 = Evaporation Pond 1, EV2 = Evaporation Pond 2, R = replicate sample

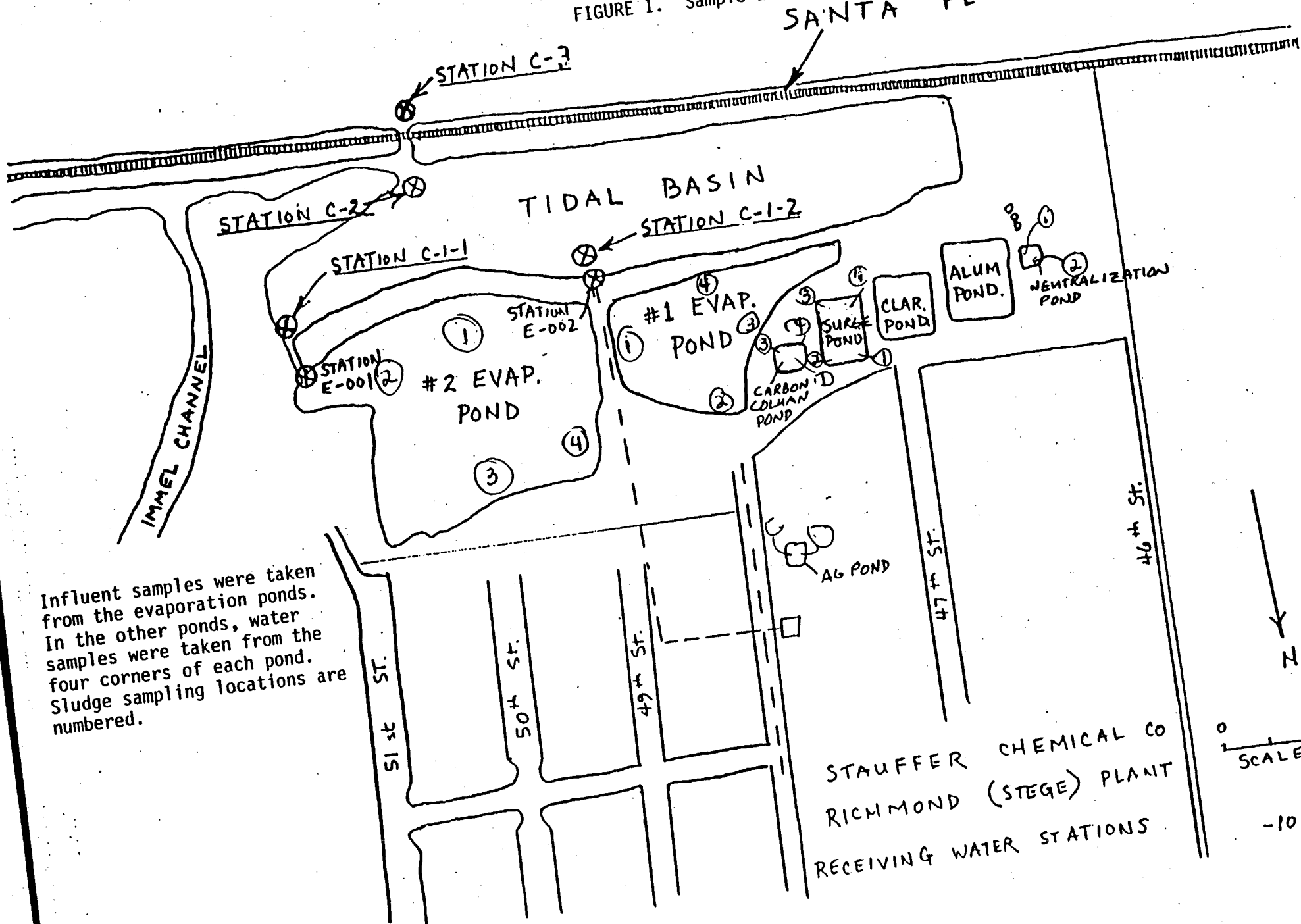
Table 10: Extractable Priority Pollutants in Water; TPCA Assessment(a)

| | | units: µg/L | |
|---|---|---|---|
| WRC Code | Description(b) | Naphthalene | 1,2-Dichlorobenzene |
| 11131-18-1 | EV1 | <2 | <2 |
| 11131-19-1 | EV2 | 6 | <2 |
| 11131-20-5 | CCP | <20 | <20 |
| 11131-23-1 | CCP-R | <20 | <20 |
| 11131-22-5 | AGP | <1 | 6 |
| 11131-26-5 | NP | <1 | <1 |
| 11131-25-5 | CP | <1 | <1 |
| 11142-19-1 | SRG | <1 | <1 |

a) Analytes quantitatied by Method 625 where a response above detection limit was recorded for at least one of the samples are listed in the table. Analyses were performed by Brown and Caldwell Laboratories.

b) NP = Neutralization Pond, SRG = Surge Pond, CCP = Carbon Colum CP = Clarification Pond, AGP = Ag Yard Pond, EV1 = Evaporation Pond 1 Influent, EV2 = Evaporation Pond 2 Influent, R = replicate sample

FIGURE 1. Sample Locations




Influent samples were taken from the evaporation ponds. In the other ponds, water samples were taken from the four corners of each pond. Sludge sampling locations are numbered.

***** CONFIDENTIAL *****
***** PREDECISIONAL DOCUMENT *****

# SUMMARY SCORESHEET FOR COMPUTING PROJECTED HRS SCORE

SITE NAME: Stauffer Chemical Company (alias ICI Americas, Inc.)

CITY: Richmond COUNTY: Contra Costa

EPA ID #: CAD009123456 EVALUATOR: John P. Zwierzycki

JOB #: 62210.28 SCORE DATE: 12/3/92

LATITUDE: 37° 54' 45" N LONGITUDE: 122° 19' 47" W T/R/S 1N / 5W /

THIS SCORESHEET IS FOR A: ☐ PA ☒ SI ☐ ESI ☐ SI Memo ☐ PA Memo ☐ Other (Spec:

RCRA STATUS (check all that apply): ☒ Generator
☐ Small Quantity Generator
☐ Transporter
☐ TDSF
☐ Not listed in RCRA Database as of (date of print out)

STATE SUPERFUND STATUS

☐ BEP (date) ☐ WQARF (date)

☒ No State Superfund Status (date) 4/24/87

| | S pathway | $S^2$ pathway |
|---|---|---|
| Groundwater Migration Pathway Score ($S_{gw}$) | * | * |
| Surface Water Migration Pathway Score ($S_{sw}$) | 100 | 10,000 |
| Soil Exposure Pathway Score ($S_s$) | 63.72 | 4,060 |
| Air Migration Pathway Score ($S_a$) | * | * |
| $S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2$ | | 14,060 |
| $(S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2)/4$ | | 3,515 |
| $\sqrt{(S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2)/4}$ | | 59.29 |

Pathways not assigned a score (explain):

* Pathways were evaluated qualitatively, not quantitatively.

# SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET

## Factor Categories and Factors

### DRINKING WATER THREAT

| Likelihood of Release | Maximum Value | Projected Score | Rationale | Data Qual. |
|---|---|---|---|---|
| 1. Observed Release | 550 | 550 | SW-1 | H |
| 2. Potential to Release by Overland Flow | | | | |
| 2a. Containment | 10 | | | |
| 2b. Runoff | 25 | | | |
| 2c. Distance to Surface Water | 25 | | | |
| 2d. Potential to Release by Overland Flow [lines 2a x (2b+2c)] | 500 | | | |
| 3. Potential to Release by Flood | | | | |
| 3a. Containment (Flood) | 10 | | | |
| 3b. Flood Frequency | 50 | | | |
| 3c. Potential to Release by Flood (lines 3a x 3b) | 500 | | | |
| 4. Potential to Release (Lines 2d + 3c, subject to a maximum of 500) | 500 | | | |
| 5. Likelihood of Release (Higher of lines 1 or 4) | 550 | 550 | | |
| **Waste Characteristics** | | | | |
| 6. Toxicity/Persistence | a | 10,000 | SW-2 | H |
| 7. Hazardous Waste Quantity | a | 10,000 | SW-3 | H |
| 8. Waste Characteristics (lines 6 x 7, then assign a value from Table 2-7) | 100 | 100 | | H |
| **Targets** | | | | |
| 9. Nearest Intake | 50 | 0 | | |
| 10. Population [d] | | | | |
| 10a. Level I Concentrations | b | 0 | | |
| 10b. Level II Concentrations | b | 0 | | |
| 10c. Potential Contamination | b | 0 | | |
| 10d. Population (lines 10a + 10b + 10c) | b | 0 | | |
| 11. Resources | 5 | 5 | SW-4 | H |
| 12. Targets (lines 9 + 10d + 11) | b | 5 | | |
| **Drinking Water Threat Score** | | | | |
| 13. Drinking Water Threat [(Lines 5 x 8 x 12)/82,500. Subject to a maximum of 100] | 100 | 3.33 | | |

# SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET

(Continued)

Factor Categories and Factors

HUMAN FOOD CHAIN THREAT

| Likelihood of Release | Maximum Value | Projected Score | Rationale | Data Qual. |
|---|---|---|---|---|
| 14. Likelihood of Release (Same value as line 5) | 550 | 550 | | |
| **Waste Characteristics** | | | | |
| 15. Toxicity/Persistence/ Bioaccumulation | a | 5.0E8 | SW-5 | H |
| 16. Hazardous Waste Quantity | a | 10,000 | SW-3 | H |
| 17. Waste Characteristics (Toxicity/Persistence x Hazardous Waste Quantity x Bioaccumulation, then assign a value from Table 2-7) | 1,000 | 1,000 | | |
| **Targets** | | | | |
| 18. Food Chain Individual | 50 | 45 | SW-6 | H |
| 19. Population [d] | | | | |
| 19a. Level I Concentrations | b | 0 | | |
| 19b. Level II Concentrations | b | 3 | SW-7 | H |
| 19c. Potential Human Food Chain Contamination | b | 0.0031 | SW-8 | E |
| 19d. Population (lines 19a + 19b + 19c) | b | 0 | | |
| 20. Targets (Lines 18 + 19d) | b | 48.0031 | | |
| **Human Food Chain Threat Score** | | | | |
| 21. Human Food Chain Threat [ (Lines 14 x 17 x 20)/82,500 subject to a maximum of 100] | 100 | 100 | | |

# SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET

(Continued)

Factor Categories and Factors

ENVIRONMENTAL THREAT

| Likelihood of Release | Maximum Value | Projected Score | Rationale | Data Qual. |
|---|---|---|---|---|
| 22. Likelihood of Release (Same value as line 5) | 550 | 550 | | |
| **Waste Characteristics** | | | | |
| 23. Ecosystem Toxicity/Persistence Bioaccumulation | a | 5 X 10E8 | SW-9 | |
| 24. Hazardous Waste Quantity | a | 10,000 | SW-3 | |
| 25. Waste Characteristics (EcosystemTox./Persistence x Hazardous Waste Quantity x Bioaccumulation, then assign a value from Table 2-7) | 1,000 | 1,000 | | |
| **Targets** | | | | |
| 26. Sensitive Environments [d] | | | | |
| 26a. Level I Concentrations | b | | | |
| 26b. Level II Concentrations | b | 725 | SW-10 | |
| 26c. Potential Contamination | b | | | |
| 26d. Sensitive Environments (lines 26a + 26b + 26c) | b | 725 | | |
| 27. Targets (Value from line 26d) | b | 725 | | |
| **Environmental Threat Score** | | | | |
| 28. Environmental Threat Score [ (Lines 22 x 25 x 27)/82,500 subject to a maximum of 60] | 60 | 60 | | |

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE FOR A WATERSHED

| | | |
|---|---|---|
| 29. Watershed Score [(Lines 13 + 21 +28), subject to a maximum of 100] | 100 | 100 [c] |

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE FOR A WATERSHED

| | | |
|---|---|---|
| 30. Component Score (Sof) (Highest score from Line 29 for all watersheds evaluated subject to a maximum of 100) | 100 | 100 [c] |

a Maximum value applies to waste characteristics category.
b Maximum value not applicable.
c Do not round to nearest integer.
d Use additional tables.

# SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET

(Continued)

20. Food Chain Targets

Actual Contamination

| Fishery | Contaminant | Concentration | Benchmark | (A) Assigned Population Value (Table 4-18) | (B) Level* Multip. | (A x B) |
|---|---|---|---|---|---|---|
| Tidal Marsh | Arsenic, etc.. | 1,660 mg/Kg | --- | 3 | 1 | 3 |
| | | | | | | |
| | | | | | | |
| | | | | | | |

* Level Multipliers
- Level I = 10
- Level II = 1

Sum (A x B) Level I: 0

Sum (A x B) Level II: 3

Potential Contamination

| Fishery | Production (1b/yr) | (P) Assigned Population Value (Table 4-18) | Average Stream Flow at Fishery (cfs) | (DW) Dilution Weighting Factor (Table 4-13) | (P x DW) |
|---|---|---|---|---|---|
| San Fran. Bay | 1,000,000 | 310 | Tidal Waters | 0.0001 | 0.031 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | Sum (P x DW) | 0.031 |

$$\text{Potential contamination} = \frac{\text{Sum (P x DW)}}{10} = 0.0031$$

(Continued)

27. Environmental Targets

Actual Contamination

| Sensitive Environment or Wetland Length (mi.) | Contaminant | Concentration | Benchmark | (A) Assigned Value (Table 4-23 and/or 4-24) | (B) Level* Multip. | (A x B) |
|---|---|---|---|---|---|---|
| Wetland (approx 0.5 miles along sloughs) | Mercury | 10.9 mg/Kg | NA | 25 | 1 | 25 |
| 4 species with value of 50 | Mercury | 10.9 mg/Kg | NA | 200 | 1 | 200 |
| salt marsh harvest mouse | Mercury | 10.9 mg/Kg | NA | 75 | 1 | 75 |
| Ca. clapper rail + 5 more species at 75 | Mercury | 10.9 mg/Kg | NA | 450 | 1 | 450 |
| San Francisco Bay Coastal Zone | PCB | 140 µg/Kg | NA | 100 | 1 | 100 |

Sum (A x B) Level I: 725

Sum (A x B) Level II: _____

* Level Multipliers
- Level I = 10
- Level II = 1

Potential Contamination

| Sensitive Environment or Wetland Length (miles) | (P) Assigned Value (Table 4-23 and/or 4-24) | Average Stream Flow at Fishery (cfs) | (DW) Dilution Weighting Factor (Table 4-13) | (A x DW) |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Sum (A x DW): _____

Potential contamination = $\frac{\text{Sum (A x DW)}}{10}$ = _____

# SOIL EXPOSURE PATHWAY SCORESHEET

## Factor Categories and Factors

### RESIDENT POPULATION THREAT

| Likelihood of Exposure | Maximum Value | Projected Score | Rationale | Data Qual. |
|---|---|---|---|---|
| 1. Likelihood of Exposure | 550 | 550 | SW-1 | H |
| **Waste Characteristics** | | | | |
| 2. Toxicity | a | 10,000 | S-1 | H |
| 3. Hazardous Waste Quantity | a | 10,000 | SW-3 | H |
| 4. Waste Characteristics | 100 | 100 | | H |
| **Targets** | | | | |
| 5. Resident Individual | 50 | | | |
| 6. Residential Population | | | | |
| 6a. Level I Concentrations | b | | | |
| 6b. Level II Concentrations | b | | | |
| 6c. Population (lines 6a+6b) | b | | | |
| 7. Workers | 15 | 5 | S-2 | E |
| 8. Resources | 5 | | | |
| 9. Terrestrial Sensitive Environments | c | 90 | S-3 | H |
| 10. Targets (lines 5+6c+7+8+9) | b | 95 | | |
| **Resident Population Threat Score** | | | | |
| 11. Resident Population Score (lines 1x4x10) | b | 5,225,000 | | |

### NEARBY POPULATION THREAT

| | | | | |
|---|---|---|---|---|
| **Likelihood of Exposure** | | | | |
| 12. Attractiveness/Accessibility | 100 | 75 | S-4 | H |
| 13. Area of Contamination | 100 | 20 | S-5 | E |
| 14. Likelihood of Exposure | 500 | 50 | | |
| **Waste Characteristics** | | | | |
| 15. Toxicity. | a | 10,000 | S-1 | H |
| 16. Hazardous Waste Quantity | a | 10,000 | SW-3 | |
| 17. Waste Characteristics | 100 | 100 | | |
| **Targets** | | | | |
| 18. Nearby Individual | 1 | 1 | S-6 | E |
| 19. Population Within 1-Mile[e] | b | 5.3 | S-7 | E |
| 20. Targets (lines 18+19) | b | 6.3 | | |

# SOIL EXPOSURE PATHWAY SCORESHEET

(Continued)

## Factor Categories and Factors

| Nearby Population Threat Score | Maximum Value | Projected Score | Rationale | Data Qual. |
|---|---|---|---|---|
| 21. Nearby Population Threat (lines 14x17x20) | b | 31,500 | | |

**SOIL EXPOSURE PATHWAY SCORE**

| | | |
|---|---|---|
| 22. Soil Exposure Pathway Score (Ss), [lines (11+21)/82,500 subject to a maximum of 100] | 100 | 63.72 |

**Nearby Population Targets**

| Distance (miles) | Total Population Within Distance Ring | (P) Distance-Weighted Population Values (Table 5-10) |
|---|---|---|
| 0 to 1/4 | 400 | 13 |
| >1/4 to 1/2 | 1,000 | 7 |
| >1/2 to 1 | 9,198 | 33 |
| | Sum (P) | 53 |

Potential Population Threat factor value = $\frac{\text{Sum (P)}}{10}$ = 5.3

a Maximum value applies to waste characteristics category.
b Maximum value not applicable.
c No specific maximum value applies to factor. However, pathway score based solely on sensitive environments is limited to a maximum of 60.
d Do not round yo nearest integer.
e Use additional tables.

**HRS Rationale**
**Stauffer Chemical Company**
**(Alias ICI Americas, Inc.)**
**EPA ID# 009123456**

## Surface Water Pathway

SW-1 An observed release of site-associated contaminants into surface water has been documented. Arsenic found in both the cinder landfill and the evaporation ponds, at levels of up to 294 milligrams per kilogram (mg/Kg) and 66.3 mg/Kg, respectively, has also been found in tidal marsh sediment samples at levels up to 1,660 mg/Kg. Copper found in both the cinder landfill and the evaporation ponds at levels of up to 1,310 mg/Kg and 1,930 mg/Kg, respectively. Copper has also been found in surface water sediment samples at levels of up to 816 mg/Kg. Cadmium found in the cinder landfill at levels of up to 15.5 mg/Kg has also been found in surface water sediment samples at levels of up to 4.1 mg/Kg. Lead found in both the cinder landfill and the evaporation ponds at levels of up to 678 mg/Kg and 64.7 mg/Kg, respectively, has also been found in surface water sediment samples at levels of up to 563 mg/Kg. Mercury found in both the cinder landfill and the evaporation ponds at levels of up to 30.2 mg/Kg and 1.7 mg/Kg, respectively, has also been found in surface water sediment samples collected from the tidal marsh at levels of up to 10.9 mg/Kg. Alpha-hexochlorocyclohexane (a-BHC) found in both the cinder landfill and evaporation ponds at levels of 150 and 38 micrograms per kilogram (µg/Kg), respectively, has also been found in surface water sediment samples collected from the tidal marsh at levels of up to 200 µg/Kg. Beta-hexochlorocyclohexane (b-BHC) found in both the cinder landfill and evaporation ponds at levels of 35 and 20 µg/Kg, respectively, has also been found in surface water sediment samples collected from the tidal marsh at levels of up to 66 µg/Kg. Gamma-hexochlorocyclohexane (Lindane) found in both the cinder landfill and evaporation ponds at levels of 27 and 39 µg/Kg, respectively, has also been found in surface water sediment samples collected from the tidal marsh at levels of up to 14 µg/Kg. Aldrin epoxide (Dieldrin) found in both the cinder landfill and evaporation ponds at levels of 52 and 14 µg/Kg, respectively, has also been found in surface water sediment samples collected from the tidal marsh at levels of up to 37 µg/Kg. P,p-Dichlorodiphenyl dichloroethlyene (DDE) found in both the cinder landfill and evaporation ponds at levels of 410 and 120 µg/Kg, respectively, has also been found in surface water sediment samples collected from the tidal marsh at levels up to 86 µg/Kg. Dichlorodiphenyl dichloroethane (DDD) found in both the cinder landfill and evaporation ponds at levels of 170 and 150 µg/Kg, respectively, has also been found in surface water sediment samples collected from the tidal marsh at levels of up to 170 µg/Kg. 4,4-dichlorodiphenyl trichloroethane (DDT) found in both the cinder landfill and evaporation ponds at levels of 1,800 and 74 µg/Kg, respectively, has also been found in surface water sediment samples collected from the tidal marsh at levels of up to 370 µg/Kg. Alpha-octachloro-4,7-methanotetrahydroindane (alpha-Chlordane) found in both the cinder landfill and evaporation ponds at levels of 22 and 6 µg/Kg, respectively, has also been found in surface water sediment samples collected from the tidal marsh at levels of up to 24 µg/Kg. Gamma-octachloro-4,7-methanotetrahydroindane (gamma-Chlordane) found in both the cinder landfill and evaporation ponds at levels of 34 and 10 µg/Kg, respectively, has also been found in surface water sediment samples collected from the tidal marsh at levels of up to 14 µg/Kg. Arochlor-1248 [a polychlorinated biphenyl (PCB)] found in the cinder landfill at 640 µg/Kg has also been found in surface water sediment

samples collected from the tidal marsh at levels of up to 160 µg/Kg. The aforementioned substances were all detected at levels greater than three times background levels for their respective environments. Soil samples collected from the cinder landfill were collected from within 2 feet of ground surface.

SW-2 The toxicity of arsenic is 10,000 and the persistence is 1.0, for a value of 10,000.

SW-3 Hazardous Waste Quantity (HWQ):

| Source | Volume | HWQ Value |
|---|---|---|
| Cinder Landfill | 15,000 cubic yards | 6.0 |
| Alum Mud Pond | 200,000 cubic feet | 2,963 |
| Clarification Pond 1 | 120,000 cubic feet | 1,778 |
| Clarification Pond 2 | 80,000 cubic feet | 1,185 |
| Evaporation Pond 1 | 150,000 cubic feet | 2,667 |
| Evaporation Pond 2 | 440,000 cubic feet | 6,667 |
| Total | | 15,266 |

HWQ Factor Value = **10,000**

SW-4 The San Francisco Bay is considered a major water recreation area.

SW-5 Mercury:

| | |
|---|---|
| Ecosystem Toxicity: | 10,000 |
| Persistence | 1 |
| Bioaccumulation (salt) | 50,000 |
| Tox/Per/Bioaccumulation | $5 \times 10^8$ |

SW-6 An observed release of site-associated contaminants (with a bioaccumulation factor value greater than 500) has been documented to the tidal marsh, within which recreational fishing occurs. Therefore, since Level II concentrations were evaluated, the Food Chain Individual target value is 45.

SW-7 Based on observations made during sampling of the Stauffer site, URS estimates that approximately 2,500 pounds of fish are caught on an annual basis from sloughs within the tidal marsh adjacent to the site. The tidal marsh is in an area of Level II contamination. Sediments collected from within the tidal marsh reveal elevated levels of contaminants greater than three times background concentrations. From Table 4-18 the assigned human food chain population value for the tidal marsh is 3.

SW-8 URS estimates that 1,000,000 pounds of fish are caught in San Francisco Bay within 15 of the site. The assigned human food chain population value for 1,000,000 pounds is 310. The human food chain population value is multiplied by the dilution weighting factor for San Francisco Bay of 0.0001 to achieve a value of 0.0310. Because this is based on potential contamination this value is multiplied by 0.1 to get the potential human food chain contamination factor value of 0.00310.

SW-9 Mercury:

| | |
|---|---|
| Ecosystem Toxicity: | 10,000 |
| Persistence | 1 |
| Bioaccumulation (salt) | 50,000 |
| Eco/Tox/Per | $5 \times 10^8$ |

SW-10 The wetlands located in the adjacent tidal marsh are habitat for up to 10 federally protected species. San Francisco Bay is protected under the Coastal Zone Management Act. See the following table for a description of these species.

**Sensitive Species Near Stauffer Chemical Company Site**

| Species | Scientific Name | Federal Status | Assigned Value |
|---|---|---|---|
| California black rail | *Laterallus jamaicensis coturniculus* | Category 1* | 75 |
| California clapper rail | *Rallus longirostris obsoletus* | Endangered | 75 |
| California least tern | *Sterna antillarum browni* | Endangered | 75 |
| tidewater goby | *Eucyclogobius newberryi* | Category 2** | 50 |
| salt marsh harvest mouse | *Tetthrodontomys raviventris* | Endangered | 75 |
| salt marsh wandering shrew | *Sorex vagrans halicoetes* | Category 1 | 75 |
| San Pablo vole | *Microtus californicus sanpabloensis* | Category 1 | 75 |
| San Francisco forktail damselfly | *Ischnura gemina* | Category 2 | 50 |
| Point Reyes bird's beak | *Cordylanthus maritimus palustris* | Category 2 | 50 |
| mimic tryonia | *Tryonia imitator* | Category 2 | 50 |
| California brown pelican | *Pelecanus occidentalis californicus* | Endangered | 75 |

*Category 1 = proposed federal threatened or endangered species
**Category 2 = species under review as to its federal endangered or threatened status

## Soil Pathway

An observed release to the soil pathway has been documented. Soil samples collected from the cinder landfill were collected from within 2 feet of ground surface. Several contaminants were detected at concentrations greater than three times background concentrations.

S-1 The toxicity value for arsenic is 10,000.

S-2 URS estimates that between 1 and 100 workers come in contact with soils known to contain elevated levels of contaminants. Therefore a factor value of 5 is given for on-site workers.

S-3 The San Pablo vole, the California least tern, the California clapper rail, the California black rail, the salt marsh wandering shrew, and the salt marsh harvest mouse are endangered or proposed to be listed as threatened or endangered, and may be present in areas of soil contamination at the site. As per section 5.1.3.5, the terrestrial sensitive environment factor value (EC) is calculated as follows:

EC = (60 x 82,500)/(likelihood of exposure) x (waste characteristics)
EC = (60 x 82,500)/(550 x 100)

EC = 90

S-4 The southern portion of the site, above the cinder landfill near sample locations S-3 and S-4, is unfenced and located adjacent to the regional "Bay Trail."

S-5 The unfenced area of contamination adjacent to the "Bay Trail" is estimated to be 25,000 square feet for a factor value of 20.

S-6 A residential area west of the site is between 0 and 1/4 miles by way of the Bay Trail from areas of known contamination; thus a nearby individual value of 1 is assigned.

S-7 Population Within 1 Mile:

| Distance | Population | Factor Value |
|---|---|---|
| 0 - 1/4 miles | 400 people | 13 |
| 1/4 - 1/2 miles | 1,000 people | 7 |
| 1/2 - 1 miles | 9,198 people | 33 |
| Total | | 53 |

Multiply by 0.1 because population within 1 mile is being evaluated under potential contamination and the factor value becomes 5.3.

## Air Pathway

The air pathway was not evaluated as part of this investigation because previous contamination via the air migration pathway was not a likely route of exposure for this site.

## Groundwater Pathway

The groundwater pathway was not evaluated quantitatively as part of this investigation because there is no known use of groundwater within 4 miles of the Stauffer site other than irrigation and industrial purposes.